



*Final*

# Environmental Assessment for Utilization Enhancements at Melrose Air Force Range, New Mexico



January  
2016



## Finding of No Significant Impact (FONSI)

### Name of the Proposed Action

Environmental Assessment (EA) for Utilization Enhancements at Melrose Air Force Range (AFR), New Mexico.

### Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to enhance training capabilities at Melrose AFR to support training requirements while creating a safer environment for trainees and the public. The Proposed Action is needed because the current range configuration does not allow for multiple, simultaneous and independent training actions to be performed safely and effectively, resulting in lowered overall training effectiveness.

### Description of the Proposed Action and Alternatives

**Proposed Action.** The Proposed Action is to reconfigure Melrose AFR to reduce range congestion and allow for efficient scheduling of simultaneous training operations. Reconfiguration would include removing the Range Support Complex from the center of the range. New operations support and training capabilities would be constructed on the perimeter of the impact area. Reconfiguration would allow the collocation of multiple surface danger zones (SDZs) and weapons danger zones (WDZs) in a centralized area so munitions training could occur without disrupting other range operations. In accordance with this reconfiguration, the Proposed Action would include the following specific actions:

- Demolition or abandonment of infrastructure that must be moved from the center of the range
- Construction or relocation of new infrastructure including administrative facilities and training features
- Installation of new utilities
- Installation of new fencing and removal of existing fencing
- Non-renewal of the Melrose Range Expansion Area (known as the land gift area) agricultural subleases and commencement of specific training activities where training has not previously occurred
- Reintroduction of explosive munitions training in the western target area
- An increase or decrease of some explosive and non-explosive munitions currently expended on Melrose AFR.
- Non-explosive munitions training in the eastern target area.

Although the Proposed Action includes construction of new training features, the types of activities conducted at those features would not differ greatly or increase from activities that currently take place on Melrose AFR. However, the reintroduction of explosive munitions training in the western target area would be considered a change in current training and is analyzed as part of the Proposed Action.

**Alternative 1.** Under Alternative 1, the USAF would implement all projects described under the Proposed Action; however, some construction projects would be located in alternative locations or would be configured differently than under the Proposed Action. This alternative would allow flexibility in future years as individual projects are approved, funded, and implemented.

Proposed facility demolition or abandonment, utilities and fencing, training in the land gift area, reintroduction of explosive munitions in the western target area, and changes in munitions expenditures under Alternative 1 would remain the same as described under the Proposed Action. Additionally, proposed increases in the amount of impervious surfaces and land disturbances would remain the same as described under the Proposed Action.

**Alternative 2.** Under Alternative 2, the USAF would implement all actions described under the Proposed Action, except the USAF would not reintroduce explosive munitions into the western target area. Alternative 2 would include all other projects described under the Proposed Action, including demolition and construction, utilities and fencing, training in the land gift area, and changes in munitions expenditures. Under Alternative 2, the western target area would continue to be used for non-explosive munitions training

**No Action Alternative.** The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and alternatives can be evaluated. Under the No Action Alternative, Melrose AFR would not be reconfigured to support more efficient training operations. Specifically, the following actions would not occur under the No Action Alternative:

- Demolition or abandonment of infrastructure in the center of the range
- Construction or relocation of new infrastructure including administrative facilities and training features
- Installation of new utilities and fencing
- Non-renewal of the land gift area agricultural subleases and commencement of specific training activities where training has not previously occurred
- Reintroduction of explosive munitions training in the western target area
- An increase or decrease of some explosive and non-explosive munitions currently expended on Melrose AFR.

However, some projects described under the Proposed Action have also been analyzed as part of the Proposed Action in other NEPA documentation. Under the No Action Alternative, these projects could still be implemented under the Proposed Action and analysis of other NEPA documents. The No Action Alternative would not meet the purpose of and need for the action.

### **Summary of Environmental Effects**

The analysis of environmental effects focused on the following environmental resources: air quality, noise, geology and soils, water resources, biological resources, cultural resources, land use, hazardous materials and wastes, health and safety, socioeconomics and environmental justice, and infrastructure and utilities. A cumulative effects assessment was also conducted. Details of the environmental consequences can be found in the *Environmental Assessment (EA) for Utilization Enhancements at Melrose Air Force Range, New Mexico*, which is hereby incorporated by reference. The analysis in the EA for each of the environmental resource areas listed above identified negligible to moderate adverse impacts under the Proposed Action. Potential environmental effects are not expected to be significant.

## Conclusion

Based on the description of the Proposed Action as set forth in the EA, all activities were found to comply with the criteria or standards of environmental quality and were coordinated with the appropriate Federal, state, and local agencies. The attached EA and this FONSI were made available to the public for a 30-day review period. Agencies were coordinated with throughout the EA development process, and their comments were incorporated into the analysis of potential environmental impacts performed as part of the EA.

## Finding of No Significant Impact

Based on the information and analysis presented in the EA which was prepared in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, implementing regulations set forth in 32 Code of Federal Regulations 989 (*Environmental Impact Analysis Process*), as amended, and based on review of the public and agency comments submitted during the 30-day public comment period, I conclude that the environmental effects of implementing utilization enhancements at Melrose AFR are not significant, that preparation of an Environmental Impact Statement is unnecessary, and that a FONSI is appropriate.



BENJAMIN R. MAITRE, Colonel, USAF  
Commander, 27th Special Operations Wing

26 JUN 2016

Date

Attachment: *Environmental Assessment (EA) for Utilization Enhancements at Melrose Air Force Range, New Mexico*



## ABBREVIATIONS AND ACRONYMS

27	27th Special Operations Air	CFR	Code of Federal Regulations
SOAOS/ RMO	Operations Squadron/Range Management Office	CO	carbon monoxide
27 SOW	27th Special Operations Wing	CO <sub>2</sub>	carbon dioxide
ACC	Air Combat Command	CZ	Clear Zone
ADNL	A-Weighted Day Night Sound Level	dB	decibel
AFB	Air Force Base	dBA	a-weighted decibel
AFCEC	Air Force Civil Engineer Center	dBc	c-weighted decibel
AFI	Air Force Instruction	DLQ	Deck Landing Qualification
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health	DNL	Day Night Sound Level
AFPD	Air Force Policy Directive	DOD	Department of Defense
AFR	Air Force Range	DZ	drop zone
AFSOC	Air Force Special Operations Command	EA	Environmental Assessment
AGL	above ground level	ECR	Electronic Combat Range
AICUZ	Air Installation Compatible Use Zone	EIAP	Environmental Impact Analysis Process
APZ	Accident Potential Zone	EIS	Environmental Impact Statement
AST	aboveground storage tank	EO	Executive Order
BCC	Birds of Conservation Concern	EOD	Explosive Ordnance Disposal
BLM	Bureau of Land Management	ESA	Endangered Species Act
BMP	best management practice	ESQD	Explosive Safety Quantity Distance
BTPD	black-tailed prairie dog	FAA	Federal Aviation Administration
CDNL	C-Weighted Day Night Sound Level	FONSI	Finding of No Significant Impact
CE	Civil Engineering	ft <sup>2</sup>	square foot/feet
CEQ	Council on Environmental Quality	GHG	greenhouse gas
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	gpm	gallons per minute
		HLZ	helicopter landing zone
		ICRMP	Integrated Cultural Resources Management Plan
		JA	Staff Judge Advocate

Leq	Equivalent Sound Level	PPE	personal protective equipment
LF	linear feet		
LID	low impact development	ppm	parts per million
LPC	lesser prairie chicken	RCEC	Roosevelt County Electric Cooperative
MBTA	Migratory Bird Treaty Act	RCRA	Resource Conservation and Recovery Act
mg/m <sup>3</sup>	milligrams per cubic meter	ROI	Region of Influence
Mini-MUTES	Miniature-Multiple Threat Emitter System	SAAQS	State Ambient Air Quality Standards
mm	millimeter	SDZ	surface danger zone
MOA	military operations area	SEL	Sound Exposure Level
MRAP	mine-resistant ambush protected vehicle	SHPO	State Historic Preservation Office
NAAQS	National Ambient Air Quality Standards	SO <sub>2</sub>	sulfur dioxide
NEPA	National Environmental Policy Act	SOCES	Special Operations Civil Engineer Squadron
NEW	net explosive weight	SOCOM	Special Operations Command
NHPA	National Historic Preservation Act	SOF	Special Operations Forces
NMED	New Mexico Environment Department	SUA	special use airspace
NO <sub>2</sub>	nitrogen dioxide	TCP	traditional cultural property
NO <sub>x</sub>	nitrogen oxide	tpy	tons per year
NPDES	National Pollution Discharge Elimination System	µg/m <sup>3</sup>	micrograms per cubic meter
NRHP	National Register of Historic Places	USACE	U.S. Army Corps of Engineers
NSA	Noise Sensitive Area	USAF	U.S. Air Force
O <sub>3</sub>	ozone	USCB	U.S. Census Bureau
Pb	Lead	USEPA	U.S. Environmental Protection Agency
PEF	Permanent Exercise Facility	USFWS	U.S. Fish and Wildlife Service
PM <sub>2.5</sub>	particulate matter with an aerodynamic size less than or equal to 2.5 microns	UST	underground storage tank
PM <sub>10</sub>	particulate matter with an aerodynamic size less than or equal to 10 microns	UXO	unexploded ordnance
ppb	parts per billion	VOC	volatile organic compound
		WDZ	weapons danger zone



**Cover Sheet**  
**Final Environmental Assessment**  
**for**  
**Utilization Enhancements**  
**at**  
**Melrose Air Force Range, New Mexico**

**Responsible Agencies:** U.S. Air Force; Air Force Civil Engineer Center; Air Force Special Operations Command; 27th Special Operations Wing; and Department of Defense.

**Affected Location:** Melrose Air Force Range, New Mexico.

**Report Designation:** Final Environmental Assessment (EA).

**Abstract:** This Environmental Assessment describes the U.S. Air Force's proposal to reconfigure Melrose Air Force Range to create more efficient and effective training capabilities and to enhance safety for range users and the public. Reconfiguration of the range would reduce congestion in the central portion of the range and allow for efficient scheduling of simultaneous training operations. The Proposed Action includes facility demolition or abandonment, construction, utilities and fencing installation, non-renewal of agricultural subleases, training operations, a reintroduction of explosive munitions to the western target area, and a change in munitions expenditures. Alternative 1 to the Proposed Action includes all elements of the Proposed Action, but proposes a different reconfiguration of the range. Alternative 2 to the Proposed Action includes all elements of the Proposed Action except the reintroduction of explosive munitions in one range.

The analysis in this EA considers the Proposed Action, Alternative 1, Alternative 2, and the No Action Alternative. The EA will aid in determining whether a Finding of No Significant Impact can be prepared or an Environmental Impact Statement is required.

Written inquiries regarding this document should be directed by mail to: Cannon Air Force Base at the attention of *Utilization Enhancements at Melrose Air Force Range*, 27 SOCES/CEIE, 506 N Air Commando Way, Cannon AFB, NM 88103, or by email at [UDG\\_27SOCES\\_EnvironmentalElement@us.af.mil](mailto:UDG_27SOCES_EnvironmentalElement@us.af.mil).



*Final*

**ENVIRONMENTAL ASSESSMENT  
FOR  
UTILIZATION ENHANCEMENTS  
AT  
MELROSE AIR FORCE RANGE, NEW MEXICO**

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**JANUARY 2016**



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# 1. Purpose of and Need for the Proposed Action

## 1.1 Introduction

This Environmental Assessment (EA) has been prepared for the U.S. Air Force's (USAF) proposed actions for utilization enhancements at Melrose Air Force Range (AFR), New Mexico. This EA is developed in compliance with the National Environmental Policy Act (NEPA); the regulations implementing NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508); Department of Defense (DOD) Directive 6050.1, *Environmental Considerations in DOD Actions*; and the USAF-implementing regulation for NEPA, the *Environmental Impact Analysis Process* (EIAP), Air Force Instruction (AFI) 32-7061. AFI 32-7061 adopts the regulations implementing the EIAP (32 CFR Part 989, as amended), as the controlling document for the EIAP.

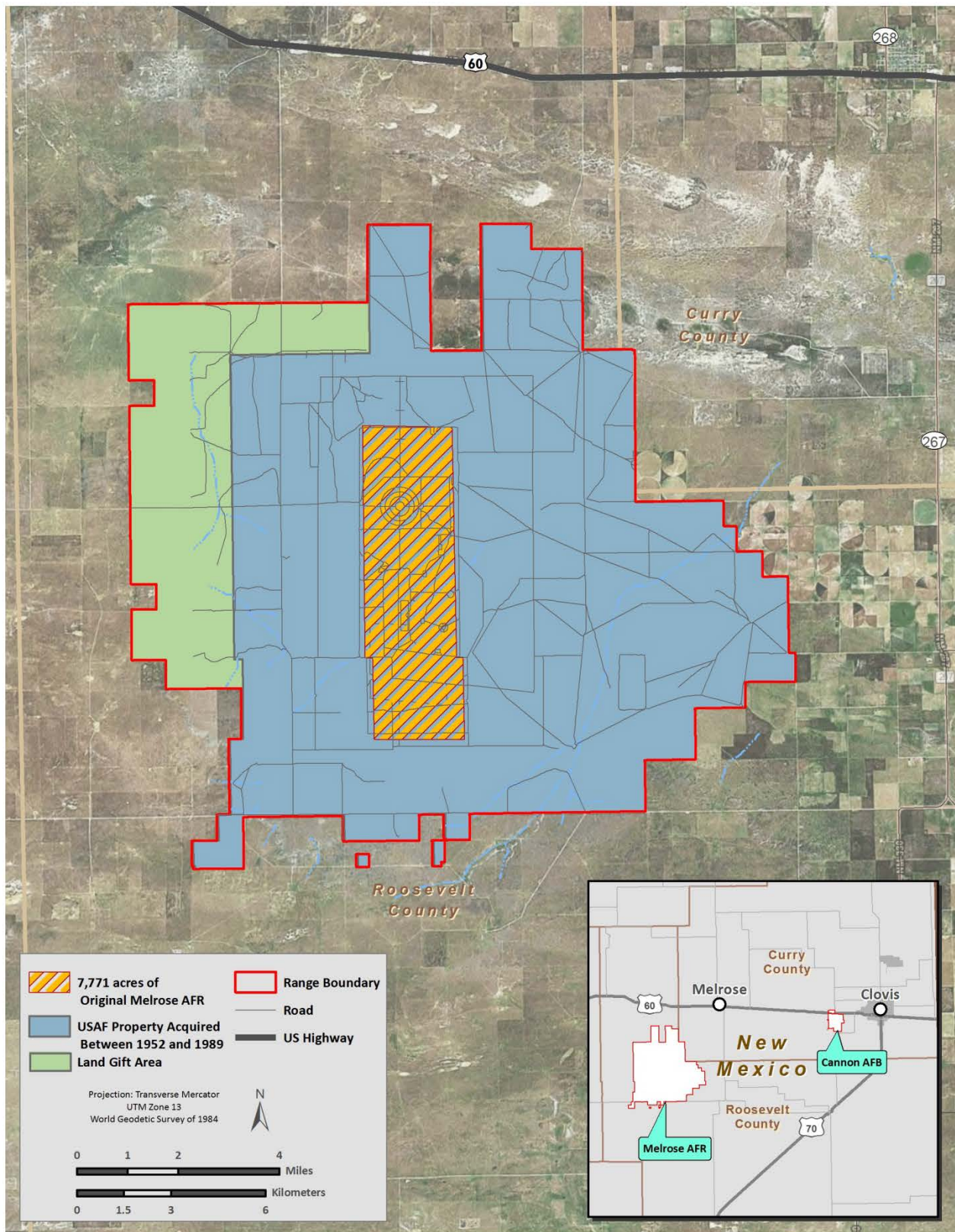
## 1.2 Organization of this Document

This EA is organized into five sections, plus appendices. **Section 1** of the EA provides historical and background information, the project location, and the purpose of and need for the Proposed Action. **Section 2** contains a description of the Proposed Action and alternatives, including the No Action Alternative. **Section 3** describes the existing conditions of the potentially affected environment and identifies the environmental consequences of implementing all reasonable alternatives. **Section 4** includes an analysis of the potential cumulative and other impacts. **Section 5** provides the names of those who prepared the EA. **Section 6** lists the references used in the preparation of this document. **Appendix A** includes the stakeholder and public involvement distribution list for the EA. **Appendix B** provides a list of existing Melrose AFR munitions expenditures. The EA presents an analysis of the potential environmental consequences of implementing the Proposed Action, alternatives, and the No Action Alternative.

## 1.3 Melrose AFR and Cannon AFB History

Melrose AFR is currently the primary air-to-ground training range used by the 27th Special Operations Wing (27 SOW), based at nearby Cannon Air Force Base (AFB), New Mexico. In 1952, the USAF acquired the original 7,771 acres of the range which was managed by the Tactical Air Command (see **Figure 1-1**). The original range acreage was used for aerial bombing and gunnery training with explosive munitions, and has been used for non-explosive munitions training in the recent past.

The USAF acquired an additional 52,239 acres of the range between 1968 and 1989 through the Military Construction Authorization Act of 1967 (Public Law 89-568), bringing the total acreage to 60,010 (27 SOW 2011). The range was subsequently managed by the Air Combat Command (ACC) to support tactical aircraft flying primarily daylight missions (Cannon AFB 2009). Cannon AFB and Melrose AFR were transferred from ACC to Air Force Special Operations Command (AFSOC) on October 1, 2007, as directed by the Secretary of Defense in May 2006. Since the transfer of Melrose AFR to AFSOC, the range has operated in support of Special Operations Forces (SOF) training activities while continuing to support the Combat Air Forces (27 SOW 2011).



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**Figure 1-1. Melrose AFR**

In 2008, the State of New Mexico proposed the Melrose Range Expansion Area for acquisition by the USAF and administration by Cannon AFB. This acquisition went through an approval process between the state and the USAF known as the “2011 Lease from the New Mexico State Land Office.” The Melrose Range Expansion Area (known as the land gift area) is adjacent to Melrose AFR and covers 10,968 acres of public land previously used primarily for agricultural activities (see **Figure 1-1**). Melrose AFR, including the land gift area, is 70,978 acres.

Currently, the Melrose land gift area is administered by Cannon AFB and is not actively used for training. The land gift area is subleased to ranchers or ranching companies with liability and hold-harmless clauses. The subleases allow access by the USAF for inspection and inventory, and when otherwise deemed necessary for the protection of government interests. For additional information related to the subleases and the Proposed Action, please see **Section 2.1.3**.

## 1.4 Project Location Description

Melrose AFR is located approximately 25 miles west of Cannon AFB in Roosevelt and Curry counties of east-central New Mexico, as shown in the inset of **Figure 1-1**. The general region surrounding Melrose AFR is rural and primarily used for agriculture and ranching. Melrose AFR consists of 70,978 acres, including the 10,968-acre land gift area described in **Section 1.3**. Melrose AFR is primarily oriented north to south on relatively flat land composed of mixed-grass prairie. The range is bounded on two sides by a mesa reaching an elevation approximately 200 feet above the range.

### 1.4.1 Current Range Operations

Melrose AFR currently provides air and ground training capabilities and supporting range facilities. Ground and air training-related features include ground training areas, landing zones, helicopter landing zones (HLZs) and drop zones (DZs), a 10,600-acre impact area, an electronic combat range, and special use airspace (SUA). Training on Melrose AFR creates weapons danger zones (WDZs) and surface danger zones (SDZs) over the range surface. Supporting facilities are located in the Range Support Complex. Range features are more thoroughly described in **Section 1.4.2**.

**Table 1-1** provides descriptions for some, but not all, specific training activities currently occurring on Melrose AFR.

### 1.4.2 Melrose AFR Features

#### 1.4.2.1 GROUND TRAINING AREAS

Ground training areas are classified as training areas or maneuver areas. Ground training may occur within the Melrose AFR impact area as specified by the 27th Special Operations Air Operations Squadron/Range Management Office (27 SOAOS/RMO) range planners. The training areas contain features such as military operations in urban terrain sites, vehicle hulks, and weapons ranges. Maneuver areas are larger than training areas and are configured for maneuver or overland navigation. Ground training activities within maneuver and training areas include movements by troops on foot and in vehicles, and small arms firing.



**Table 1-1. Current Range Activities**

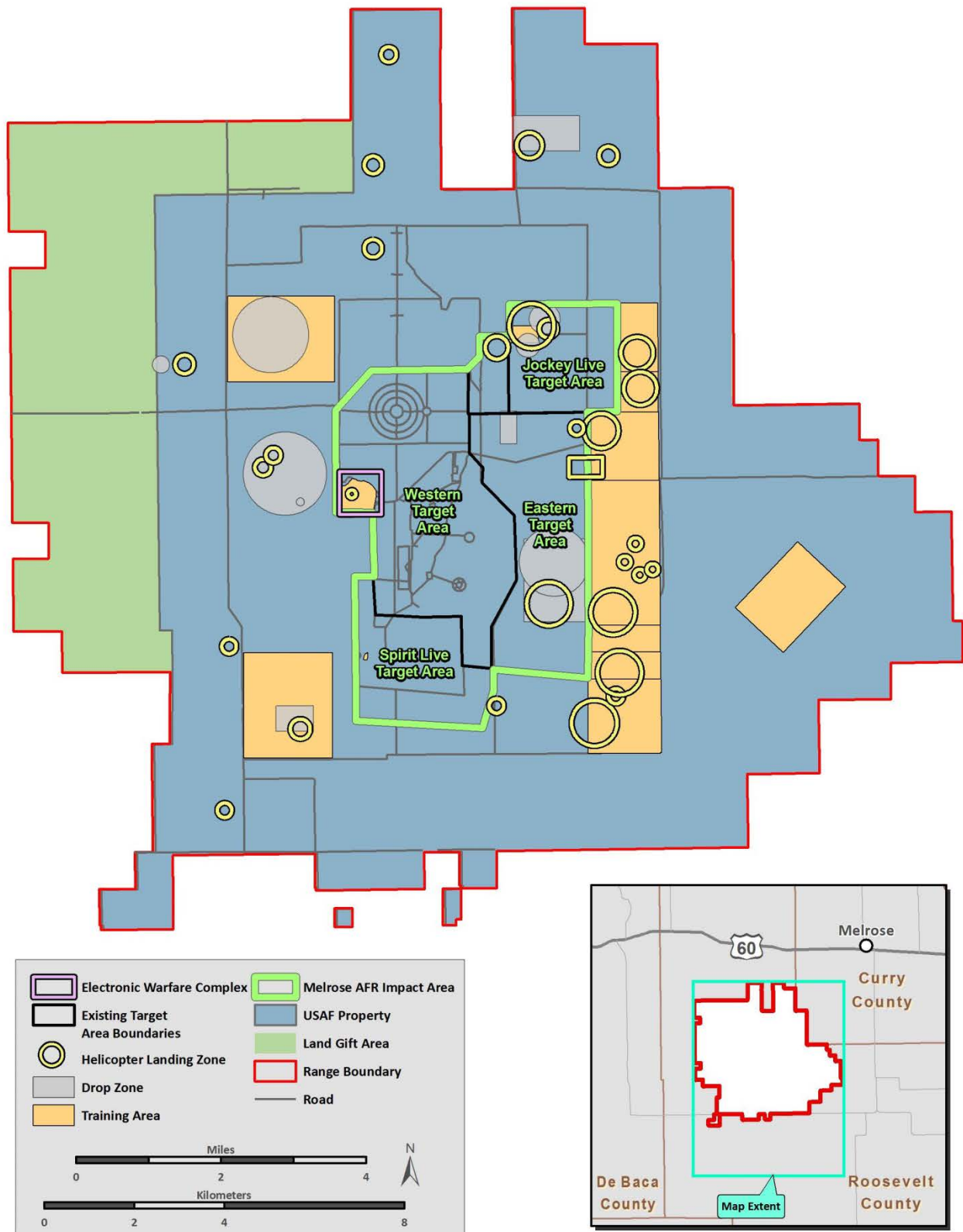
Action	Description
Direct fire explosive munitions training	Firing weapons and ammunition that explode, either from weapons systems on the ground or from aircraft sighted directly on a target. Direct fire explosive munitions training does not include launch of explosive bombs, which are dropped from aircraft and may or may not be sighted to a target. Direct fire of explosive munitions only occurs into designated target areas.
Joint exercises	Training exercises between multiple services and units. Involves coordinated actions between ground (foot and vehicle) and air assets.
Guided and unguided inert aerial bombardment	Launch of non-explosive bombs from aircraft.
Aerial strafing	Attack on ground features by aircraft flying at a low altitude.
Close air support	Actions by aircraft on targets located in close proximity to ground troops. Requires close coordination of fire and movement between aircraft and ground units.
Survival, evasion, rescue, and escape (known as SERE)	Coordinated and individual maneuvers on foot including land navigation and communication.
Intelligence, surveillance, and reconnaissance	Coordinated acquisition and processing of information and movements (ground and air) of hostile troops.
Electronic warfare	Interfering, or preventing interference, with electronic signals emitted from aircraft and munitions.
Small arms and heavy weapons employment	Firing of munitions capable of being carried and those mounted on supporting equipment including vehicles and aircraft. Small arms munitions are non-explosive and do not have to be fired into an impact area. Heavy weapons can be explosive or non-explosive.
Urban warfare	Training within and around facilities representing urban environments.
Counter improvised explosive device	Disarming non-explosive munitions that resemble and are designed as improvised explosive devices.
HLZ, LZ, and DZ operations	Deployment of personnel and cargo from hovering aircraft and aircraft that have landed.

Ground training on Melrose AFR is conducted by the USAF and visiting personnel from the U.S. Army, Navy, and Marine Corps. The 27th Security Forces Squadron uses a small arms range on Melrose AFR for weapons systems that cannot be fired on Cannon AFB. The small arms range is also used when the primary firing range on Cannon AFB is unavailable. Additionally, organizations on Cannon AFB with deployment commitments routinely train on Melrose AFR because realistic ground combat scenarios can be created.

Ground training occurs across Melrose AFR within the maneuver and training areas identified in **Figure 1-2**.

#### 1.4.2.2 HLZS AND DZS

HLZs and DZs are located within ground training areas so air and ground training operations can be integrated, as required. DZs are used by fixed wing (i.e., airplanes), tiltrotor (e.g., CV-22 Osprey), and rotary wing (i.e., helicopters) aircraft. HLZs are only used by tiltrotor and rotary wing aircraft. Both HLZs and DZs support aircraft training including approaches, landings, departures, and aerial delivery of cargo and personnel. HLZs and DZs on Melrose AFR are shown in **Figure 1-2**.



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**Figure 1-2. Current Melrose AFR Configuration**

#### 1.4.2.3 IMPACT AREAS

The Melrose AFR impact area is located in the center of the range. The 10,600-acre impact area contains two live target areas for explosive munitions (i.e., Jockey and Spirit), non-explosive practice munitions, manned sites, small arms ranges, and fire breaks.

#### 1.4.2.4 ELECTRONIC COMBAT RANGE

The Melrose Electronic Combat Range (ECR) is primarily located on Melrose AFR and is comprised of a variety of specialized electronic combat systems. The ECR is used to simulate electronic threats to aircraft and munitions so units can train to disarm or avoid these threats. The ECR includes a scoring system to provide feedback. Electronic systems located on Melrose AFR do not emit signals beyond the Melrose AFR boundary or SUA. **Figure 1-2** provides the location of the main control facility for the ECR, known as the Electronic Warfare Complex.

#### 1.4.2.5 SUA

SUA is defined airspace where aircraft activities are confined because of their nature. SUA can include limitations put on aircraft operations not within the defined activities of the SUA. SUA above and surrounding Melrose AFR includes restricted areas (i.e., R-5104A, R-5104B, and R-5105), military operations areas (MOAs) (i.e., Pecos, Taiban, Mount Dora, and Bronco), and military training routes. SUAs associated with Melrose AFR supports aircraft training including approaches, departures, low-level flying activities, and air-to-ground explosive and non-explosive munitions delivery (Cannon AFB 2009).

#### 1.4.2.6 SDZS AND WDZS

SDZs and WDZs are computer-generated boundaries that identify the area within which munitions and associated debris would be contained after firing. SDZs are three-dimensional and include the ground and air associated with ground-based munitions firing. WDZs are three-dimensional and encompass the ground and airspace associated with air-to-ground munitions firing. The size and configuration of SDZs and WDZs depend on the weapons system, training requirements, range configuration, location, and environmental conditions. SDZs and WDZs represent the minimum safety requirements designed for explosive munitions training on DOD ranges.

USAF regulations require access to and use of all lands within the composite WDZs and SDZs be restricted to ensure the safety of personnel, structures, and the public (USAF 2007a). Because only mission-essential personnel are allowed to be present in an SDZ or WDZ during munitions training, land uses contained in these areas are severely limited during weapons operation. SDZs and WDZs are not shown in a figure in this document because the generation of SDZs and WDZs is variable depending on the weapons system and location on Melrose AFR.

#### 1.4.2.7 RANGE SUPPORT COMPLEX

Approximately 11 acres of Melrose AFR are used for the Range Support Complex. Functions contained in the Range Support Complex include training supervision and surveillance, emergency fire services, range communications, equipment and vehicle maintenance, target construction, and other administrative functions. The Range Support Complex is located near

the center of the range in the northern portion of both the western target area and eastern target area shown in **Figure 1-2**. WDZs and SDZs do not overlay the Range Support Complex. For traffic entering and exiting the Range Support Complex, operations are managed to ensure ground traffic is de-conflicted from the employment of munitions or other tactical events.

### 1.4.3 Range Management

#### 1.4.3.1 SCHEDULING

Use of Melrose AFR, including the ground training areas, HLZs and DZs, target areas, and ECR, is scheduled through an AFI-directed scheduling tool. Range scheduling is managed by the Scheduling Authority, 27 SOAOS/RMO. Users from 27 SOW typically have priority in the scheduling process. A scheduling system is built around a cascading priority scheme that factors in contingency preparation, directed exercises, student training, service affiliation, and other specific requirements. All off-station users (those not stationed at Cannon AFB) are scheduled on a first-come, first-served basis according to the priority level of the event (Cannon AFB 2014). Due to the current design and configuration of Melrose AFR, range management and scheduling requires consideration of training event compatibility and congestion.

#### 1.4.3.2 CONFIGURATION

The use of certain ground training and impact areas on Melrose AFR frequently precludes the simultaneous use of other features due to safety constraints. As shown in **Figure 1-2**, ground training areas on Melrose AFR may occur within the impact area. This configuration does not consistently allow simultaneous training events involving explosive munitions fire and ground movement. Simultaneous events are often constrained due to movement restrictions within SDZs and WDZs, and general congestion considerations. Additionally, the Range Support Complex is located in the center of Melrose AFR in close proximity to the danger area, which is the composite of all weapons safety footprints (e.g., SDZs and WDZs) for the range. This location constrains training capabilities because training events have to be located and scheduled to prevent risk to personnel within the Range Support Complex. Lastly, some HLZ and DZ locations are within the center of the range. Aircraft operations involving HLZs and DZs preclude use of explosive munitions on the ground when aircraft operations would fall within SDZs. Similarly, aircraft participating in explosive munitions training precludes all ground training within the WDZ, except for participating mission-essential personnel. As such, employing explosive munitions into the impact area precludes use of training and operations within the WDZs and SDZs, except by participating mission-essential personnel. Therefore, the current configuration of the range does not allow for efficient range training and operation.

#### 1.4.3.3 RANGE CLEARANCE AND MAINTENANCE

The 27 SOAOS/RMO ensures target areas meet mission requirements. In accordance with AFI 13-212, *Range Planning and Operations*, range management includes clearance of unexploded ordnance (UXO) from the surface of target areas on a regular basis by explosive ordnance disposal (EOD) technicians. The range operating support contractor performs range and target maintenance.

## 1.5 Melrose AFR Vision

The Melrose AFR vision is “Department of Defense’s premier Special Operations training complex, relevant and sustainable, focusing on AFSOC core missions that support joint, integrated SOF missions, and DOD air and ground training” (Cannon AFB 2014). As described in **Section 1.4.3.2**, the current design of Melrose AFR precludes the use of certain training features due to safety constraints and does not allow for efficient operations of all training features. The current range design is a remnant of the former ACC mission, and there is a need to reconfigure the range so air-to-ground and ground-to-ground training can occur more effectively. As a range heavily used by AFSOC, U.S. Special Operations Command (SOCOM), and other DOD entities, Melrose AFR must be able to provide training capabilities that support current missions and provide flexibility for new missions and units. The vision statement for Melrose AFR embodies the maximum utility of the innate qualities of the range for current and future missions.

## 1.6 Purpose and Need

The purpose of the Proposed Action is to enhance training capabilities at Melrose AFR to support training requirements while creating a safer environment for trainees and the public. The Proposed Action is needed because the current range configuration does not allow for multiple, simultaneous and independent training actions to be performed safely and effectively, resulting in lowered overall training effectiveness.

The Proposed Action is also needed to support AFSOC training capabilities at Melrose AFR for current missions, to provide flexibility for future missions and units, and to improve efficiency of infrastructure and training venues on the range. In addition to AFSOC training, Melrose AFR provides training support to other users from SOCOM and DOD, as available (27 SOW 2011). The Proposed Action would create more efficient and effective training opportunities for the units that use Melrose AFR.

The purpose and need of the Proposed Action is focused on enhancing training capabilities at Melrose AFR because it is the primary air-to-ground training range used by the 27 SOW, which is based at nearby Cannon AFB. Meeting 27 SOW training requirements at a range other than Melrose AFR would be difficult due to costs and logistics of transporting personnel, equipment, and aircraft to other training locations within the United States. Additionally, because Melrose AFR is managed by Cannon AFB, the 27 SOW has scheduling authority to train at the range. AFSOC and 27 SOW training activities are not the scheduling priority at other DOD ranges.

## 1.7 NEPA Compliance Requirements

NEPA is a Federal law requiring the analysis of potential environmental impacts associated with proposed Federal actions before the actions are taken. The intent of NEPA is to make decisions informed by potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ), which is responsible for ensuring Federal agency compliance with NEPA. CEQ NEPA regulations specify an EA be prepared to determine whether to prepare a Finding of No Significant Impact (FONSI) or the preparation of an Environmental Impact Statement (EIS) is



necessary. The EA can aid in an agency's compliance with NEPA when an EIS is unnecessary and facilitate preparation of an EIS when one is required. The CEQ NEPA regulations mandate all Federal agencies to use a prescribed approach to environmental impact analysis. The approach includes evaluation of potential environmental consequences associated with a Proposed Action and considers alternative courses of action.

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is EIAP, AFI 32-7061. This EA was developed in compliance with the EIAP. If significant impacts are predicted, the USAF would decide whether to conduct mitigation to reduce impacts below the level of significance, prepare an EIS, or abandon the Proposed Action.

## 1.8 Intergovernmental and Stakeholder Coordination

NEPA requirements help ensure environmental information is made available to the public during the decision-making process and prior to actions being taken. A premise of NEPA is that the quality of Federal decisions will be enhanced if the public is involved in the planning process. The Intergovernmental Coordination Act and Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider territorial and local views when implementing a Federal proposal. In compliance with NEPA, Cannon AFB notified relevant agencies, stakeholders, and federally recognized tribes about the Proposed Action and alternatives (see **Appendix A** for stakeholder and public involvement distribution list). The notification process included distribution of the Final Description of the Proposed Action and Alternatives and the Draft EA to parties listed in **Appendix A**. The USAF also provided a Notice of Availability for the Draft EA in the Clovis News Journal and the Portales News Tribune, which initiated a 30-day public review period. These notification processes provided the public, relevant agencies, stakeholders, and federally recognized tribes the opportunity to cooperate with Cannon AFB and provide comments on the Proposed Action and potential environmental impacts.

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## 2. Description of the Proposed Action and Alternatives

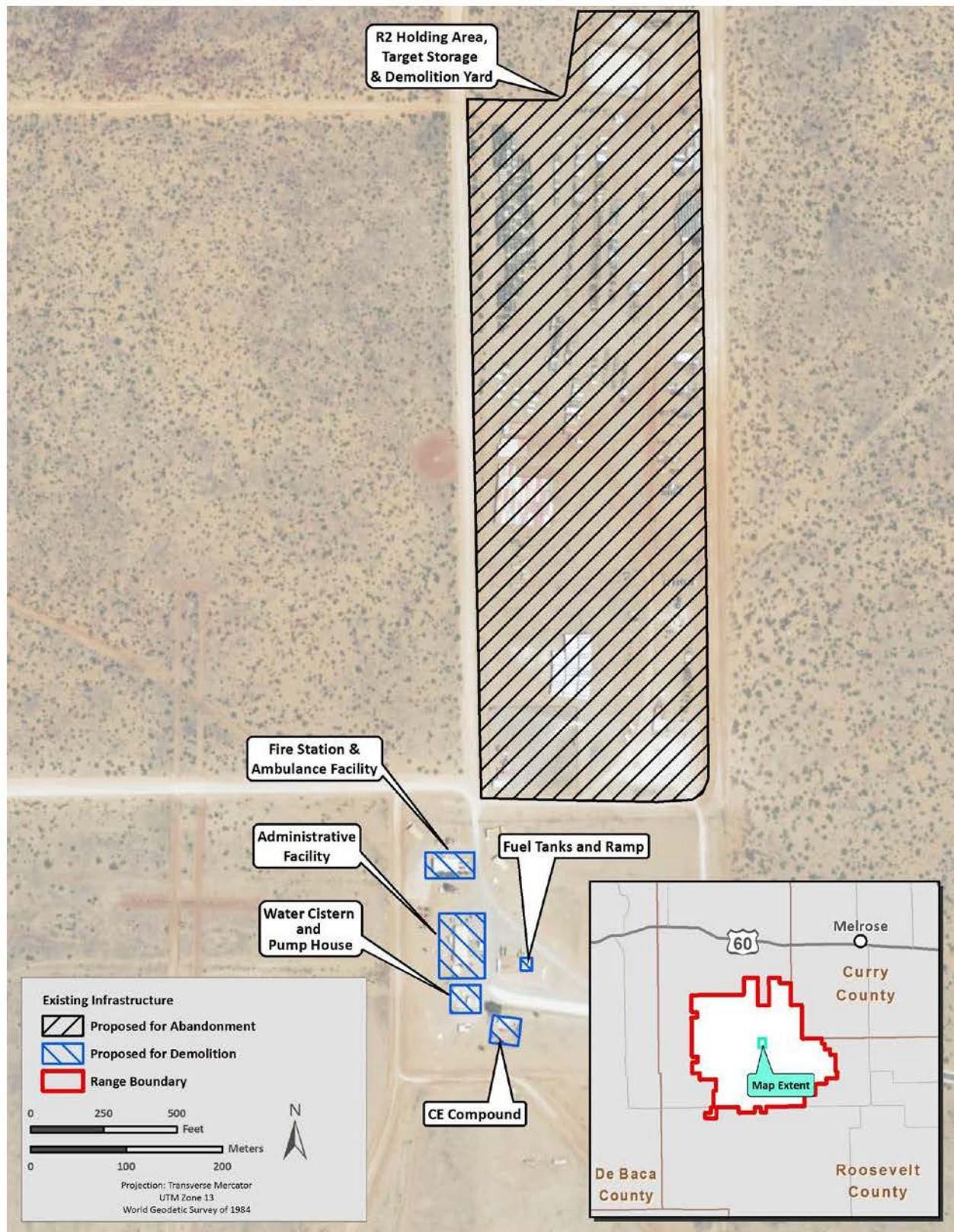
This section provides detailed information about the Proposed Action and alternatives considered, including the No Action Alternative. The NEPA process evaluates potential environmental consequences associated with a Proposed Action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for the Proposed Action, as defined in **Section 1.6**. In addition, CEQ NEPA regulations specify the inclusion of a No Action Alternative against which potential effects can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in accordance with the CEQ regulations.

### 2.1 Proposed Action

The Proposed Action is to reconfigure Melrose AFR as shown in **Figures 2-1** and **2-2**. Reconfiguration would include removing the Range Support Complex from the center of the range. New operations support and training capabilities would be constructed on the perimeter of the impact area. Reconfiguration of the range would reduce range congestion and allow for efficient scheduling of simultaneous training operations. Reconfiguration would allow the collocation of multiple SDZs and WZs in a centralized area so munitions training could occur without disrupting other range operations. In accordance with this reconfiguration, the Proposed Action would include the following specific actions:

- Demolition or abandonment of infrastructure that must be moved from the center of the range
- Construction or relocation of new infrastructure including administrative facilities and training features
- Installation of new utilities
- Installation of new fencing and removal of existing fencing
- Non-renewal of the land gift area agricultural subleases and commencement of specific training activities where training has not previously occurred
- Reintroduction of explosive munitions training in the western target area
- An increase or decrease of some explosive and non-explosive munitions currently expended on Melrose AFR.
- Non-explosive munitions training in the eastern target area. However, this action is dismissed from environmental analysis in this document as described in **Section 2.1.6.1**.

Although the Proposed Action includes construction of new training features, the types of activities conducted at those features would not differ greatly or increase from activities that currently take place on Melrose AFR described in **Section 1.3**. Continuation of current range activities at new training features would include the activities described in **Table 1-1**. However, the reintroduction of explosive munitions training in the western target area would be considered a change in current training and will be analyzed as part of the Proposed Action. This document



Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 2-1. Facilities Proposed for Demolition or Abandonment on Melrose AFR



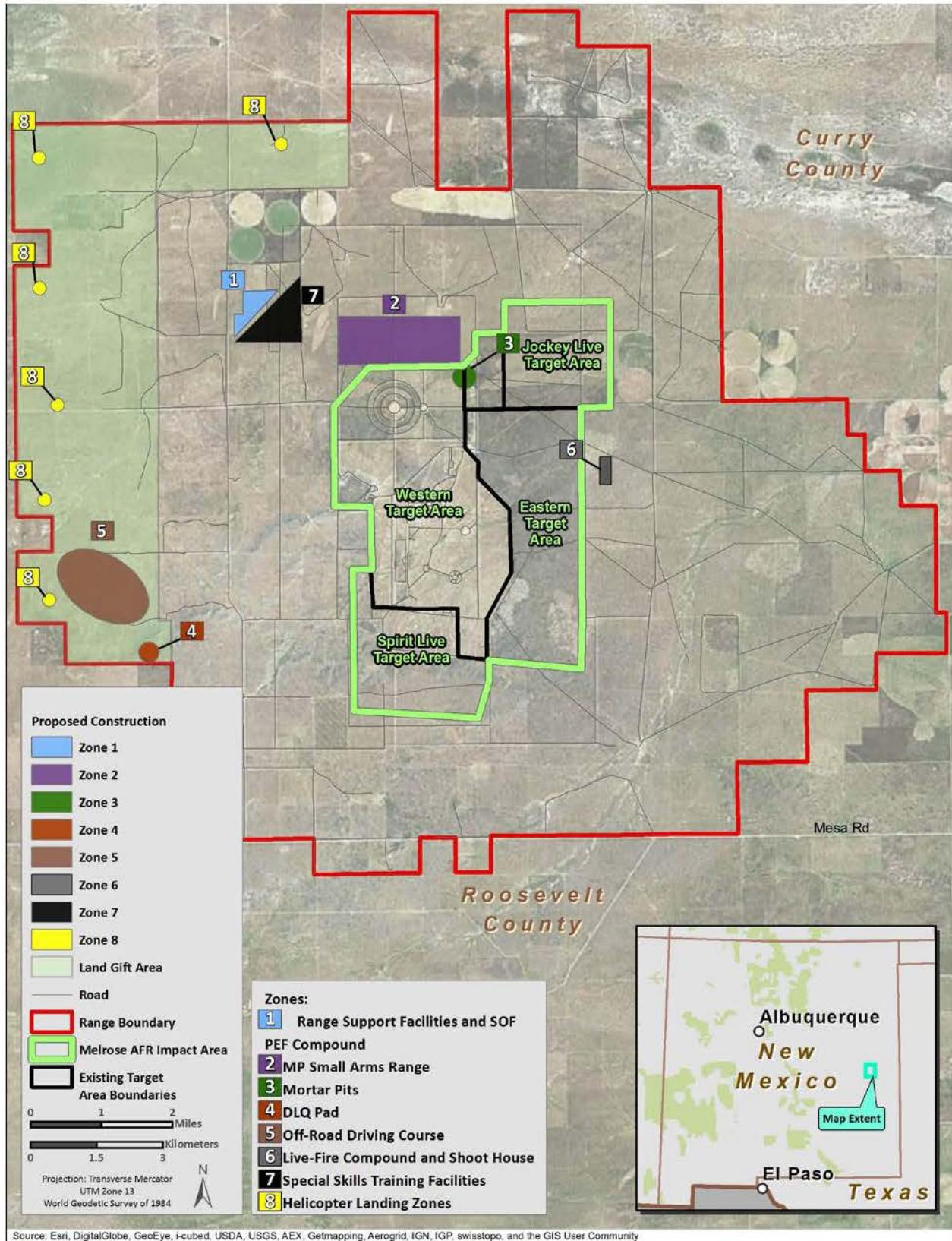


Figure 2-2. Facilities Proposed for Construction on Melrose AFR

accounts for ground maneuvers at new training features by analyzing an area of disturbance for each feature. There would be no explosive munitions expenditures in the land gift area, consistent with current use. Details regarding each element of the Proposed Action are provided in the following paragraphs.

### 2.1.1 Demolition and Construction

**Demolition.** To remove facilities from the center of the range, approximately 69,880 square feet (ft<sup>2</sup>) of facilities would be demolished on Melrose AFR. Additional facilities would be abandoned and reconstructed in other locations on the range as described in the following **Construction** section. **Table 2-1** provides details on each facility proposed for demolition or abandonment and relocation, and **Figure 2-1** provides the current locations of these facilities.

**Table 2-1. Proposed Demolition and Abandonment Projects**

Action	Timeline	Decrease in Impervious Surfaces	Area of Disturbance
Demolish the administrative facility.	2018–2020	34,285 ft <sup>2</sup>	0.79 acre
Demolish the fire station and ambulance facility	2018–2020	14,777 ft <sup>2</sup>	0.34 acre
Demolish CE compound.	2018–2020	9,157 ft <sup>2</sup>	0.21 acres
Demolish water cistern and pumphouse	2018–2020	9,874 ft <sup>2</sup>	0.23
Relocate fuel tanks. Demolish concrete pad will be left in place; therefore, there would be no decrease in impervious surfaces.	2016	1,787 ft <sup>2</sup>	0.04 acres
Abandon the holding area, target storage, and demolition yard. The concrete pad will be left in place, and the fence will be moved. Therefore, there would be no decrease in impervious surfaces.	2018–2020	0 ft <sup>2</sup>	0 acres
<b>Total decrease in impervious surfaces</b>		<b>69,880 ft<sup>2</sup></b>	
<b>Total area of disturbance</b>			<b>1.61 acres</b>

**Construction.** Individual projects proposed for construction have a stand-alone utility to improve training operations on Melrose AFR but also contribute to the overall purpose of and need for the Proposed Action. While each project would increase the effectiveness of Melrose AFR if implemented alone, full implementation of each proposed project would result in a greater benefit to range operations. The EA addresses all potential impacts individually and collectively to the extent feasible given the independent nature of the various projects of the Proposed Action.

Individual projects proposed for construction on Melrose AFR are grouped into “zones” in accordance with facility similarity and location on the range. It is assumed individual projects could be constructed anywhere within their identified zone, and therefore the entire zone would be an area of disturbance. **Table 2-2** is organized by zone and presents the total area of disturbance for each zone, a description of each construction project, approximate facility footprint (i.e., impervious surfaces), and proposed construction timeline. Zones and projects presented in **Table 2-2** are shown in **Figure 2-2**.

**Table 2-2. Proposed Construction Zones and Projects**

Project	Year	Footprint Size (impervious surface)	Project Description
<b>Zone 1 - Proposed Range Support Facilities and SOF Permanent Exercise Facility (PEF) Compound</b>			
Fire Station	2017	14,943 ft <sup>2</sup>	A new fire station would provide upgraded support for Melrose AFR's missions.
Range Operations Control Facility*	2015	5,300 ft <sup>2</sup>	The range operations control facility would house range control, administrative functions, and communications maintenance. The project includes installation and tie-in of all communications (both secure and non-secure) with the antenna pad' utilities; fire suppression; heating, ventilation, and air conditioning; backup generator with pad; storage tank' improved roads; site improvements; landscaping; and all required facility support.
Range Vehicle Maintenance Facility*	2015	5,000 ft <sup>2</sup>	This facility would support vehicle maintenance operations for the range support fleet.
Target Construction and Storage Facility	2016–2017	3,500 ft <sup>2</sup>	A storage facility would be constructed to house target arrays and materials for repairing and maintaining the HLZs and DZs.
Demilitarization and target prep building and boneyard area	2018–2020	2,000 ft <sup>2</sup>	A new target processing building would include a concrete explosives residue storage pad. This area would include a fenced boneyard and small concrete pads for hazardous materials fluid storage.
Range Operations Vehicle Parking	2018–2020	6,480 ft <sup>2</sup>	Forty parking spaces would be constructed for access to the Range Operations Facility and other facilities within this area. It is assumed the average parking space is 9 feet x 18 feet and this parking area would be paved.
Fuel Storage Tanks	2016	500 ft <sup>2</sup>	New fuel tanks and vehicle fuel station would be constructed in the new range control area on concrete pads. Construction projects include a vehicle fueling station; a 2,000-gallon diesel fuel tank; a 2,000-gallon mobile gasoline fuel tank; and a regular gas 1,000-gallon fuel tank.
Joint Operations Planning Facility*	2015	8,000 ft <sup>2</sup>	A facility would be constructed in the PEF compound with a secure area for all tactical operational equipment, a planning room, a large classroom to support visiting SOF personnel, a drive-through garage for storage and building deployment pallets, and a communications storage room.
Additional Operations and Administrative Planning Facilities	2020	20,000 ft <sup>2</sup>	Construct four additional 5,000-ft <sup>2</sup> operations planning facilities.
SOF PEF Marshalling Yard	2020	10,625 ft <sup>2</sup>	The SOF PEF compound would include a 10,000-ft <sup>2</sup> paved marshalling yard and a 625-ft <sup>2</sup> utility pad.
SOF PEF Vehicle Parking*	2015–2020	3,240 ft <sup>2</sup>	Construct 20 unpaved vehicle parking spaces within the SOF PEF compound for personnel visiting and using the compound. It is assumed the average parking space is 9 feet by 18 feet and would be compacted gravel, and therefore impervious.



Project	Year	Footprint Size (impervious surface)	Project Description
Zone 1 - Proposed Range Support Facilities and SOF Permanent Exercise Facility (PEF) Compound (continued)			
*Denotes project previously analyzed in the <i>Melrose Air Force Range Environmental Assessment for the Comprehensive Range Plan, July 2011</i>			
Zone 1 Total Facility Footprint	66,138 ft <sup>2</sup>		
Zone 1 Total Acreage	981 acres		
Zone 2 - Multi-purpose Small Arms Range			
Small Arms Range Control Tower	2018	400 ft <sup>2</sup>	A small tower would be constructed as an observation point for users of the small arms range.
Ammunition Breakdown Building	2018	185 ft <sup>2</sup>	The ammunition breakdown building would be used for munitions sorting and handling before and after small arms range training. This building would not be used for any ammunitions storage.
Range Classroom	2018	3,000 ft <sup>2</sup>	A classroom would be constructed adjacent to the small arms range for briefing before and after training events.
Range Target, Storage, and Repair Building	2018	800 ft <sup>2</sup>	A facility would be constructed adjacent to the small arms range for storage of new targets and target repair materials.
Multi-purpose Small Arms Range	2018	0 ft <sup>2</sup>	The Multi-purpose Small Arms Range would be constructed on the north end of the impact area and would be approximately 60 lanes wide, with each lane being 66 feet (20 meters) wide, and 3,281 feet (1,000) meters long, and would not include any pavement.
Small Arms Range Vehicle Parking	2018	1,620 ft <sup>2</sup>	A paved parking area with 10 spaces would be constructed for users of the small arms range. It is assumed the average parking space is 9 feet x 18 feet.
Zone 2 Total Facility Footprint	6,005 ft <sup>2</sup>		
Zone 2 Total Acreage	1,012 acres		
Zone 3 – Mortar Pits			
Mortar Pits*	2020	0 ft <sup>2</sup>	Four mortar pits for 60-millimeter (mm) and 81-mm mortars would be located on the western edge of the existing northern impact area. These pits would not require paving or concrete and would be dirt pits. The mortar pits for 60-mm and 81-mm mortars would be approximately 10 feet wide and a maximum of 5 feet deep. Construction for a heavy mortar pit (greater than 81 mm) is the same, except the pit diameter is 11.5 feet. Therefore, it is assumed the mortar pits would disturb a surface area of approximately 415 ft <sup>2</sup> .
Pit Over Watch Tower	2020	400-ft <sup>2</sup> base	A tower would be erected to provide visibility of the mortar pits. The base of the tower would be approximately 400 ft <sup>2</sup> .



Project	Year	Footprint Size (impervious surface)	Project Description
Zone 3 – Mortar Pits (continued)			
*Denotes project previously analyzed in the <i>Melrose Air Force Range Environmental Assessment for the Comprehensive Range Plan, July 2011</i>			
Zone 3 Total Facility Footprint	400 ft <sup>2</sup>		
Zone 3 Total Acreage	57 acres		
Zone 4 – Deck Landing Qualification (DLQ) Pad			
V-22 DLQ Pad	2016–2018	45,000 ft <sup>2</sup>	A landing pad for the V-22 aircraft that simulates a carrier deck and is approximately 300 feet x 150 feet would be located in the land gift area. The total area disturbed for the DLQ pad would be approximately 5,000 square yards, including the overrun base. A total of 5,000 linear feet (LF) of lighting would be installed.
Zone 4 Total Facility Footprint	45,000 ft <sup>2</sup>		
Zone 4 Total Acreage	85 acres		
Zone 5 – Off-Road Driving Course			
Off-Road Driving Course	2016	132,000 ft <sup>2</sup>	A dirt driving tract, approximately 3 miles long and 25 feet wide, would be staked in the southern portion of the land gift area. The course would be used for off-road driving training and practice for two-wheel to large four-wheel vehicles. Although the course would not be purposely graded and compacted, it is assumed the course would become compacted over time during use, resulting in a mostly impervious surface. The off-road driving track would be constructed in the land gift area and disturb approximately 621 acres.
Zone 5 Total Facility Footprint	132,000 ft <sup>2</sup>		
Zone 5 Total Acreage	621 acres		
Zone 6 – Live-Fire Compound and Shoot House			
Live-Fire Compound and Shoot House	2020	6,000 ft <sup>2</sup>	The live-fire compound area would include a structure of approximately 3,000 ft <sup>2</sup> , with two floors of approximately 1,500 ft <sup>2</sup> each. The area would include a wall surrounding the complex and would disturb approximately 40 acres of land. Included within the live-fire compound area would be a close-quarters combat multi-story shoot house, of approximately 3,000 ft <sup>2</sup> .
Zone 6 Total Facility Footprint	6,000 ft <sup>2</sup>		
Zone 6 Total Acreage	40 acres		

Project	Year	Footprint Size (impervious surface)	Project Description
Zone 7 – Special Skills Training Facilities			
Breaching Ranges and Facilities (all)*	2015–2020	180 ft <sup>2</sup>	The construction of the breaching ranges would disturb approximately 100 acres of land due to ground and foot maneuver but would not include the addition of 100 acres of impervious surface. The breaching ranges area would include the construction of the two building facades, approximately 30 feet x 3 feet, for a total of 180 ft <sup>2</sup> of impervious surfaces. The remaining acreage within the breaching range facility would include areas for equipment breaching, including a bulldozer, vehicle, or power plant hulk.
Demolition Range	2018	0 ft <sup>2</sup>	A dirt field within the special skills training zone would be used as a charge course for EOD training. This area would not include the addition of any impervious surface.
Tunnels and Sewers	2020–2025	0 ft <sup>2</sup>	Mock tunnels and sewers would be constructed in the special skills training zone and would include digging and backfill in this area. However, no additional increase in impervious surface is planned.
*Denotes project previously analyzed in the <i>Melrose Air Force Range Environmental Assessment for the Comprehensive Range Plan, July 2011</i>			
Zone 7 Total Facility Footprint	180 ft <sup>2</sup>		
Zone 7 Total Acreage	290 acres		
Zone 8 – HLZs			
HLZs	2016	0 ft <sup>2</sup>	Six HLZs would be constructed on the perimeter of the range boundary within the land gift area. Each HLZ would be approximately 1,000 feet in diameter, or an area of approximately 785,000 ft <sup>2</sup> (18 acres) per HLZ. HLZs would not be graded or covered with an impervious surface. However, because helicopters or tiltrotor aircraft could land anywhere within the HLZ, the entire area is considered an area of disturbance.
Zone 8 Total Facility Footprint	0 ft <sup>2</sup>		
Zone 8 Total Acreage	108 acres		

**Summary of Demolition and Construction.** Under the Proposed Action, construction of facilities in **Table 2-2** would create an associated increase in impervious surfaces on Melrose AFR of approximately 257,723 ft<sup>2</sup>. However, the total impervious surfaces on Melrose AFR would only be increased by approximately 187,843 ft<sup>2</sup> (4.3 acres), which accounts for both proposed construction and demolition. This increase in impervious surfaces of 4.3 acres is approximately 0.006 percent of Melrose AFR. Additionally, demolition or abandonment of structures in **Table 2-1** and **Figure 2-1**, and construction and maneuver within the zones identified in **Table 2-2** and **Figure 2-2**, would result in a total land disturbance of approximately 3,297.61 acres. This area of disturbance is approximately 4.6 percent of Melrose AFR. A summary of impervious surface and disturbance increases is provided in **Table 2-3**.

**Table 2-3. Proposed Construction and Demolition Summary**

	Impervious Surfaces (ft <sup>2</sup> )	Area of Disturbance (acres)
Demolition/Abandonment	-69,880 ft <sup>2</sup>	+1.61
Construction	+257,723 ft <sup>2</sup>	+3,296
<b>Total</b>	<b>+187,843 ft<sup>2</sup></b>	<b>+3,297.61</b>
<b>Total Increase in Impervious Surfaces as Percentage of Melrose AFR Area</b>	0.006%	4.6%

## 2.1.2 Utilities and Fencing

To support the reconfiguration of range support facilities, additional utilities and fencing would be installed on the range. It is assumed a 30-foot-wide corridor would be required for the installation of each linear utility and fencing. All underground utilities would be installed approximately 4 feet below the surface. A description of these projects is provided in **Table 2-4** and proposed locations are provided in **Figure 2-3**, with the exception of the land gift area fencing. Land gift fencing would take place on the outside perimeter of the land gift area shown in **Figure 2-4**. Where appropriate, existing fencing would be removed where it is no longer needed or to allow for the installation of new fencing.

## 2.1.3 Land Gift Area

### 2.1.3.1 SUBLEASE NON-RENEWAL

As described in **Section 1.3**, the 10,968-acre area known as the land gift area is currently administered by the USAF under a lease agreement with the State of New Mexico. The land gift area is subleased by the USAF to ranchers or ranching companies with clauses for restricted training. Under the Proposed Action, all four subleases would not be renewed in September 2015. Non-renewal of the subleases would allow the USAF to locate several range features identified in **Section 2.1.1** and **Table 2-2**, such as the HLZs, on the perimeter of the range. Moving numerous operations from the center of the range to the perimeter would reduce training congestion and prevent interference between these operations and explosive munitions training.

During the implementation of the lease agreement with the State of New Mexico, the USAF stipulated any proposed change in current land use would be analyzed for potential environmental impacts. This EA satisfies that requirement.

**Table 2-4. Proposed Utilities and Fencing Projects**

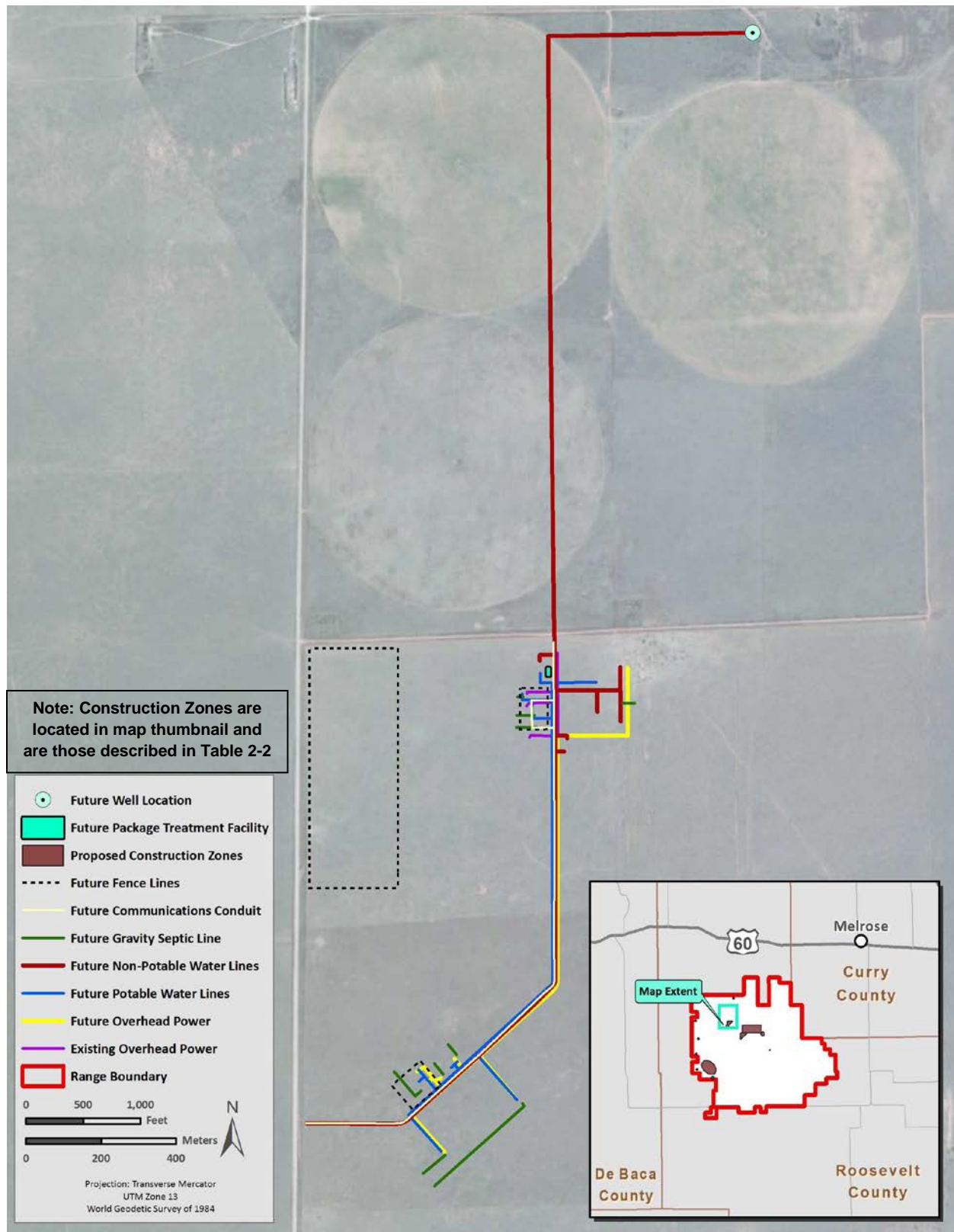
Project	Year	Area of Disturbance	Description
<b>Non-Potable Water</b>	2016–2017	430,750ft <sup>2</sup>	Approximately 14,350 LF of non-potable water lines would be installed underground and could be used for fire suppression purposes. Non-potable water supply would include construction of a 250-ft <sup>2</sup> water treatment package facility and a well. Non-potable water lines would run between the treatment facility and the well, and to the SOF PEF facility and range support facilities (see <b>Table 2-2</b> ).
<b>Potable Water</b>	2016–2017	208,200ft <sup>2</sup>	Approximately 6,940 LF of potable water lines would be installed underground for personnel use. Potable water lines would run to the SOF PEF facility and range support facilities (see <b>Table 2-2</b> ).
<b>Sewer</b>	2016–2017	7,200ft <sup>2</sup>	Approximately 2,400 LF of sewer lines would be installed underground to support sanitation. Sewer lines would be run from SOF PEF and range support facilities (see <b>Table 2-2</b> ) to existing and new septic fields.
<b>Power</b>	2016–2017	196,200ft <sup>2</sup>	Approximately 6,540 LF of overhead power lines would be installed for the new SOF PEF and range support facilities (see <b>Table 2-2</b> ).
<b>Communications</b>	2016–2017	187,500ft <sup>2</sup>	Approximately 6,250 LF of underground communications conduit and fiberlink would be installed for the new SOF PEF and range support facilities (see <b>Table 2-2</b> ).
<b>Land Gift Fencing</b>	2016	2,490,000 ft <sup>2</sup>	After the land gift subleases are not renewed, a fence would be erected around the perimeter of the land gift area. The fence would be metal, wire, or wood, or a combination of these materials. The fence would be approximately 83,000 LF.
<b>SOF PEF Fencing</b>	2014–2016	243,600 ft <sup>2</sup>	The SOF PEF compound would include 8,120-LF of fencing topped with three-strand barbed wire and containing two keyless entry access gates.
<b>Total Disturbance</b>		<b>3,376,450 ft<sup>2</sup> (77.5 acres)</b>	

### 2.1.3.2 TRAINING

Following non-renewal of the agricultural subleases on the land gift area and completion of appropriate construction as described in **Section 2.1.1**, the USAF would begin using the area for training purposes. Specific details regarding each type of training proposed within the land gift area are provided in the following subsections, and training features are shown in **Figure 2-4**.

#### 2.1.3.2.1 HLZs and DLQ Pad

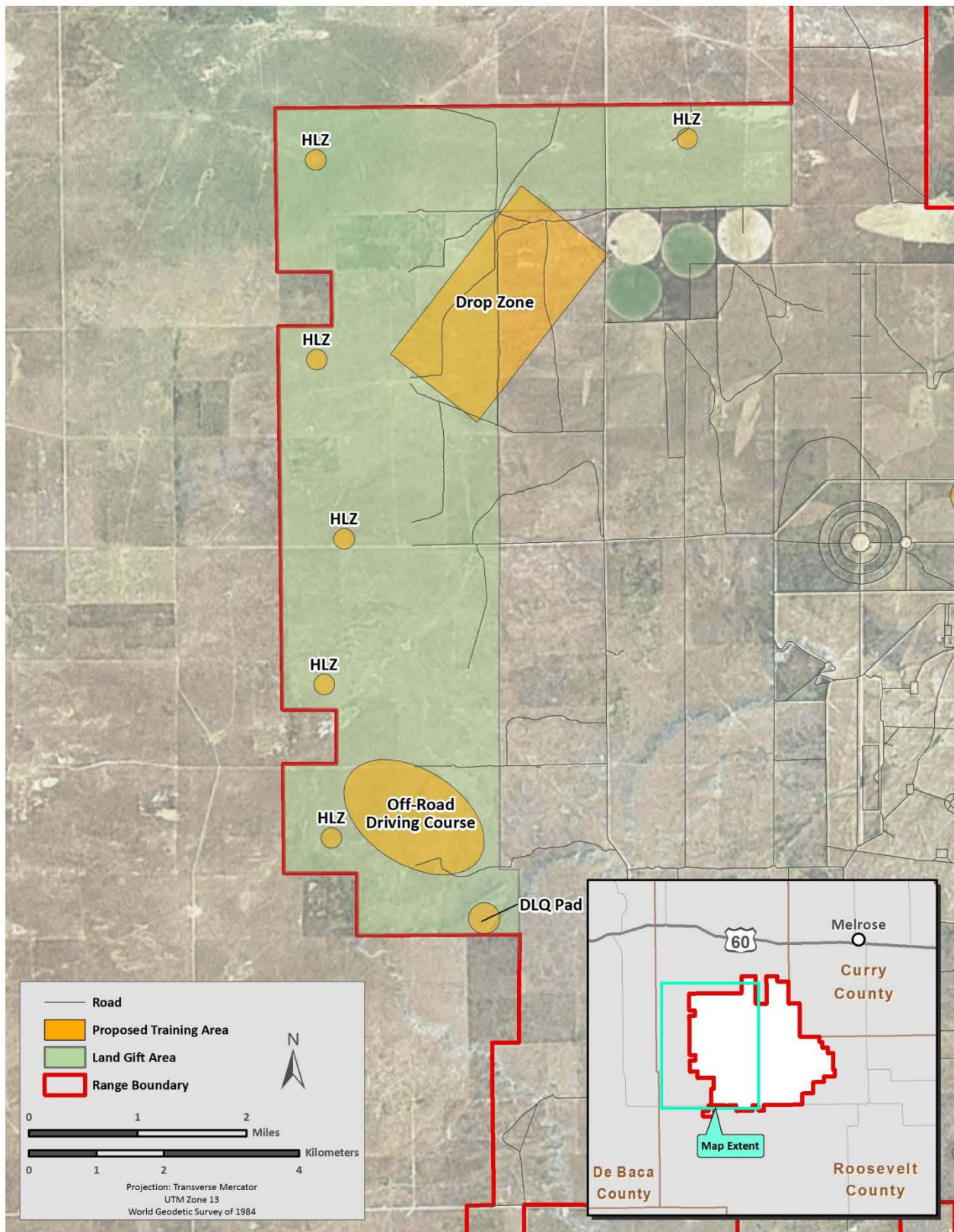
Six HLZs would be located on the perimeter of the land gift area, and a DLQ pad would be constructed in the southeastern corner of the area. Construction details for these features are provided in **Section 2.1.1** and specifically, **Table 2-2**. It is assumed there would be no increase in helicopter or tiltrotor (e.g., CV-22) flights and landings on the range beyond current levels. Under the Proposed Action, the majority of current helicopter and tiltrotor training would occur at the HLZs, DLQ pad, and DZ in the land gift area rather than within the center of Melrose AFR.



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 2-3. Utilities and Fencing Proposed within the Range Boundary





**Figure 2-4. Proposed Land Gift Area Training**

**Table 2-5** provides information on the types of training that could occur at the HLZs and DLQ pad in the land gift area, including training by CV-22s. This is not an exhaustive list of the helicopter or tiltrotor training operations but provides a representation of training types.

**Table 2-5. Proposed HLZ and DLQ Pad Training Summary**

Training Type	Description
Approach and Landing Procedures	Training in conversion to helicopter mode, traffic pattern, go-around, vertical and rolling landings, steep approach, and heavyweight operation
Formation	Training for flying, take-off, and landing with other aircraft, usually in a two-ship group
Night Vision Goggle Sortie	Conduct low-altitude flight, landing, and departing operations at night; for CV-22 training in both airplane and helicopter modes
Alternate Insertion and Extraction	Training in techniques for inserting/extracting troops; insertion activities could include fast rope or rope ladder over a precise spot
Remote Operations	Landings conducted in undeveloped areas
Lift/Hoist Operations	Operating equipment for transport of personnel, cargo, and equipment

In total, the seven helicopter and tiltrotor landing areas (i.e., six HLZs and one DLQ pad) could be used for up to 6 hours per day; or approximately 50 minutes per landing area per day. Helicopters and tiltrotor aircraft would participate in minimal hover time when approaching the landing areas, and dwell time on the ground per landing would be approximately 5 minutes. During this dwell time, the majority of the helicopters or tiltrotor aircraft would remain running. Upon landing during each training operation, only minor foot or wheeled ground maneuver would occur in the land gift area.

All helicopter and tiltrotor activity over Melrose AFR would take place within current USAF-operated and Federal Aviation Administration (FAA)-approved airspace. No modifications to flight procedures or airspace would be needed. SUAs immediately adjacent to and surrounding Melrose AFR that would allow for helicopter and tiltrotor landings in the land gift area includes Restricted Area R-5104A, Restricted Area R-5105, Pecos North High MOA, Taiban MOA, and Pecos South MOA.

#### **2.1.3.2.2 Off-Road Driving Course**

An off-road driving course would be staked (not graded) in the southern portion of the land gift area. Course development details are provided in **Section 2.1.1**. The course would be used for off-road driving training and practice for two-wheel to large four-wheel vehicles, including, but not limited to: High Mobility Multipurpose Wheeled Vehicles also known as Humvees, all-terrain vehicles, motorcycles, and mine-resistant ambush protected vehicles (MRAPs). Approximately two vehicles would each drive the 3-mile course at 20 miles per hour, three times each per day, 5 days per week. Vehicles would practice maneuvering through the natural terrain, including through ditches and on slopes of approximately 21 degrees.

#### **2.1.3.2.3 Drop Zones**

One DZ would be designated in the northwest portion of the land gift area, but would not require grading, staking, construction, or additional road access. For DZ training, there would be no increase in helicopter, tiltrotor, or aircraft flights beyond current levels, as described in **Section**

**2.1.3.2.1.** The DZ would be used by helicopters, tiltrotor, and cargo aircraft (e.g., CV-22, C-130, C-7) for the aerial delivery of people and supplies (e.g., water barrels). The DZ would not be used for landings by any aircraft. The DZ would be used for approximately 1 hour at a time or 10 hours per week. There would be no aircraft hover associated with the use of the DZ.

As described in **Section 2.1.3.2.1**, all aircraft activity associated with DZ use would take place within current USAF-operated and FAA-approved airspace. No modifications to flight procedures or airspace would be needed.

#### **2.1.4 Western Target Area**

Currently, only non-explosive munitions training occurs in the western target area of the Melrose AFR impact area. Under the Proposed Action, the range reconfiguration would include the reintroduction of air- and ground-to-ground direct fire explosive munitions training in the western target area (see **Figure 2-5**). Direct fire explosive munitions' training does not include the launch of explosive bombs. Reintroduction of explosive munitions in the western target area would support efficient training on the range by centralizing multiple SDZs and WDZs so simultaneous training activities could occur without disrupting other range operations.

The reintroduction of explosive munitions in the western target area would not alter the current ground or airspace boundaries of the range, and non-explosive munitions training would continue to occur.

Although the overall acreage of target areas within the Melrose AFR impact area designated for explosive munitions would increase under this element of the Proposed Action, munitions expenditures would not change from current levels with the exception of those described in **Section 2.1.5**. The western target area would be managed consistent with the management of Jockey and Spirit live target areas.

#### **2.1.5 Munitions Expenditures**

Reconfiguration of Melrose AFR under the Proposed Action would create a change in training capabilities and effectiveness; therefore, an associated increase or decrease in some munitions expenditures is projected. Projected changes in munitions expenditures accounts for all explosives and non-explosives munitions training that would occur on Melrose AFR under the Proposed Action, including within the Melrose AFR impact area.

**Table 2-6** compares the proposed expenditures to the existing expenditures per year on Melrose AFR. Changes in munitions expenditures under the Proposed Action would not result in an increase of net explosive weight (NEW) beyond levels currently expended on Melrose AFR. With the exception of these proposed munitions expenditures changes provided in **Table 2-6**, all other munitions expenditures would remain the same as those documented in **Appendix B** of this document and the *2011 Environmental Assessment for the Comprehensive Range Plan, Melrose AFR*.



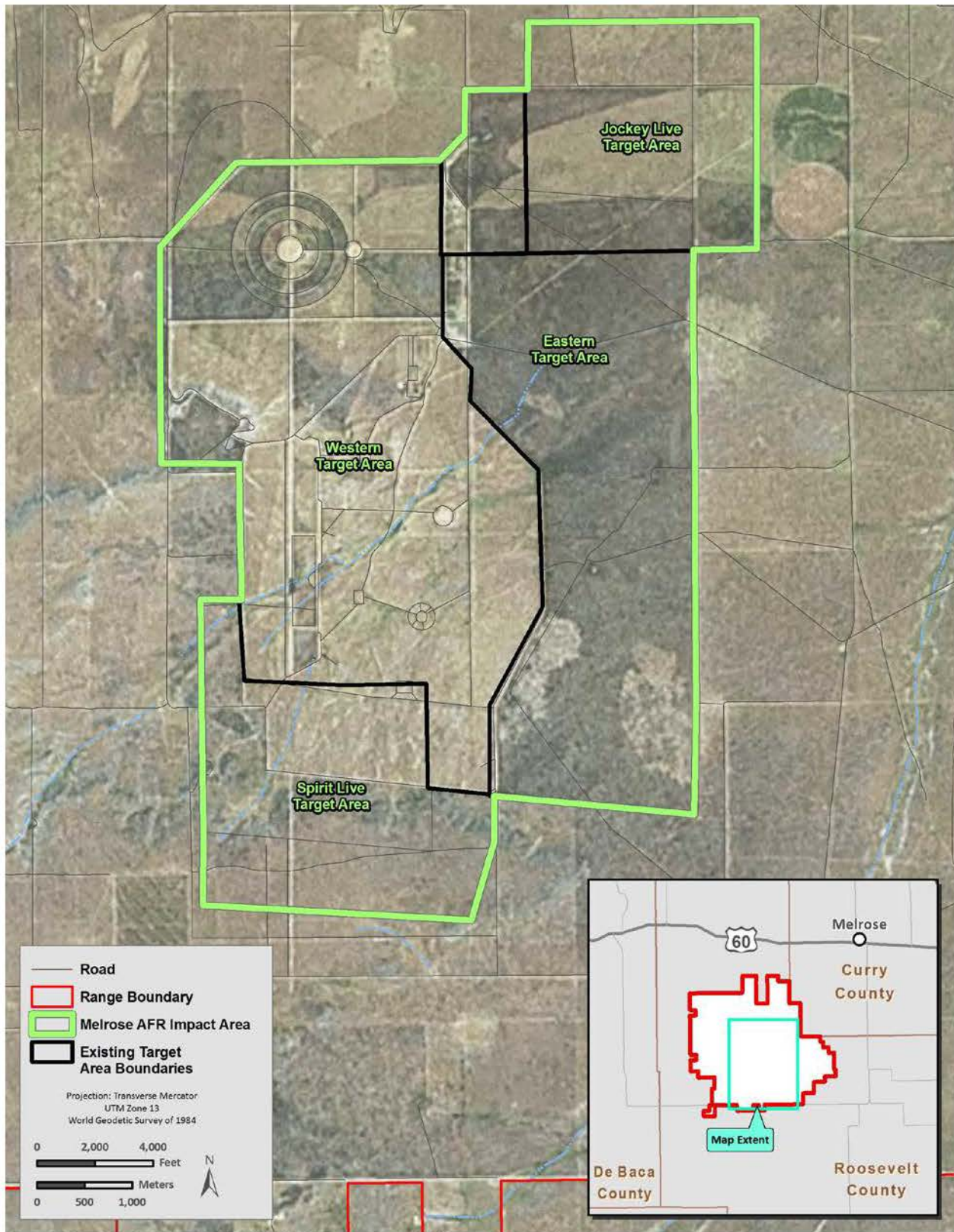


Figure 2-5. Western Target Area Location

**Table 2-6. Proposed Munitions Expenditures and NEW**

Munitions	Existing Expenditures	Proposed Expenditures	Change in Amount	Change in NEW (pounds)
Bomb Dummy Unit (BDU)50 Low Drag*	50	205	<b>+155</b>	<b>0</b>
30-mm Training Practice*	50,000	65,000	<b>+15,000</b>	<b>0</b>
30-mm High Explosive Incendiary	90,000	165,000	<b>+75,000</b>	<b>+7,110</b>
40-mm High Explosive Incendiary /Armor Piercing Incendiary	40,000	15,000	<b>-25,000</b>	<b>-600</b>
40-mm Armor Piercing Tracer	40,000	10,000	<b>-30,000</b>	<b>-9,094</b>

\*non-explosive

## 2.1.6 Elements of the Proposed Action Dismissed from Further Environmental Analysis

### 2.1.6.1 NON-EXPLOSIVE MUNITIONS TRAINING IN THE EASTERN TARGET AREA

Reconfiguration of Melrose AFR under the Proposed Action would include non-explosive munitions training in the eastern target area, in addition to the ground maneuvers currently occurring, to allow units to retreat from an area, and return fire on that area. This training was previously conducted in the western target area but can no longer be executed there due to the mandate described in **Section 1.4.2.3** as well as the proposal to reintroduce explosive munitions into the western target area as described in **Section 2.1.4**.

Under this element of the Proposed Action, the eastern target area would contain simulated targets including non-permanent structures, enemy tactical vehicles, and weapons emplacements. Non-explosive munitions would be fired in the eastern target area from aircraft and weapons that currently utilize or are operated on Melrose AFR. Non-explosive munitions expenditures on Melrose AFR would not change from current levels, with the exception of those described in **Section 2.1.5**.

Types and levels of munitions expenditures, both explosive and non-explosive, authorized for use on Melrose AFR are described in the *2011 Environmental Assessment for the Comprehensive Range Plan, Melrose AFR* (27 SOW 2011). Additionally, the eastern target area was previously analyzed for the use of non-explosive munitions, specifically white phosphorous rockets, as part of Alternative A in the *2003 Environmental Assessment for the Use of White Phosphorus Rockets at Melrose Air Force Range, New Mexico* (ACC 2003).

Potential environmental impacts in the eastern target area from the proposed non-explosive munitions expenditures described above would be the same or less than those impacts described in the 2003 EA. White phosphorous rockets consist of a charge that emits smoke and heat upon impact, whereas some munitions proposed for use in the eastern target area do not (ACC 2003). Additionally, proposed non-explosive munitions expenditures in the eastern target area would be consistent with the types and levels of non-explosive munitions currently expended on Melrose AFR as previously analyzed in the 2011 EA and provided in **Appendix B** of this document. Any changes in munitions expenditures, including those non-explosive munitions that would occur in the eastern target area, are described in **Section 2.1.5** of this

document. Therefore, additional environmental analysis of non-explosive munitions training in the eastern target area is not provided in this document. Analysis for non-explosive munitions training in the eastern target area is hereby incorporated by reference from the 2003 and 2011 EAs (27 SOW 2011, ACC 2003).

#### 2.1.6.2 PROJECTS WITH NO POTENTIAL FOR EFFECTS

Several projects being proposed on Melrose AFR as part of the range reconfiguration would not, individually or cumulatively, have the potential for significant effects on human health and the environment due to the nature of the action.

**Table 2-7** provides a list of these activities as part of the Proposed Action, but they will not be analyzed further in this document.

**Table 2-7. Elements of the Proposed Action Dismissed from Further Environmental Analysis**

Action	Year	Reason for Dismissal
Install Render-Safe Mockups	2015–2020	Render-safe mockups are pieces of equipment that do not require a paved or hardened surface for installation and use.
Install Convoy Live Fire Course	2015–2020	A convoy live-fire course would include the installation of existing targets along an existing road on the range and would not substantially alter the land use.
Repair Existing Capabilities of Electronic Countermeasures Equipment	Present–2020	Repairing existing electronic countermeasures equipment would not require the installation of any new equipment or facilities.
Configure Denied Access Areas	Present–2020	Configuring denied access areas would not require the installation of any new equipment or facilities.
Complete Integrated Air Defense Systems Tactics, Techniques and Procedures/Profiles	Present–2020	Completing Integrated Air Defense Systems Tactics, Techniques and Procedures/Profiles is an equipment/technology-based activity and would not alter the land use.
Issue an Opposing Forces (OPFOR) Indefinite Delivery/Indefinite Quantity Contract	Present–2020	Issuing an Opposing Forces Indefinite Delivery/Indefinite Quantity contract would be considered the routine procurement of services.
Obtain and Install Joint Threat Emitter and Advanced Radar Threat System	2019–Future	Joint Threat Emitter and Advanced Radar Threat System are pieces of equipment that do not require a paved or hardened surface for installation and use.
Implement Use of Jammer Authorities	Present–2020	Implementing use of jammer authorities is an equipment/technology-based activity and would not alter the land use.
Complete Miniature-Multiple Threat Emitter System (Mini-MUTES) Upgrade	Present	Upgrading the mini-MUTES equipment is an ongoing equipment/technology-based activity and would not alter the land use.
Obtain Excess Equipment from other Ranges	Present–2020	Obtaining excess training equipment from other ranges would be considered the routine procurement of goods and services.



These types of activities include the following:

- Routine procurement of goods and services
- Installing equipment that does not substantially alter land use on previously developed land
- Repairing and replacing real property installed equipment
- Installing, operating, modifying, and routinely repairing and replacing utility and communications systems, data processing cables, and similar electronic equipment that use existing rights-of-way, easements, distribution systems, or facilities.

## 2.2 Selection of Alternatives to the Proposed Action

Considering alternatives helps to avoid unnecessary impacts and allows for an analysis of reasonable ways to achieve a purpose. To warrant detailed evaluation, an alternative must be reasonable. To be considered reasonable, an alternative must be suitable for decision making, capable of implementation, and sufficiently satisfactory with respect to meeting the purpose of and need for the action. NEPA regulations define reasonable alternatives as economically and technically feasible, and showing evidence of common sense.

Certain facility, operational, and mission requirements must be present or reasonably attainable to meet the purpose of and need for the Proposed Action. As described in **Section 1.6**, the purpose and need of the Proposed Action is focused on Melrose AFR. The following selection standards were developed based on operational training considerations for Melrose AFR. The selection standards were applied to range design alternatives identified by 27 Special Operations Civil Engineer Squadron (SOCES), 27 SOW/Staff Judge Advocate (JA), and 27 SOAOS/RMO to select alternatives considered reasonable and to be carried forward for analysis in the EA.

The following selection standards were used in developing the Proposed Action and alternatives:

- **General.**
  - Non-hazardous activities should be located on the perimeter of the range to prevent overlap of SDZs and WDZs on these training activities and allow simultaneous training by multiple users.
  - Siting considerations should support development where infrastructure/utilities and water are currently located.
  - Siting considerations should minimize impacts on existing roads and firebreaks.
  - SDZs, WDZs, and impact areas must be overlapped to the extent possible to provide the most efficient and safe operation of the range.
- **HLZ.** HLZ siting requires sufficient airspace to allow training approaches into the wind. Wind patterns in the Cannon AFB and Melrose AFR region are predominantly from the southwest to the northeast; therefore, the majority of approaches to HLZs are required to occur from the northeast. HLZ training requires helicopters or tiltrotor aircraft to

approach simultaneously; therefore, at least two HLZs need to be adjacent and allow for approaches into the wind.

- **Off-Road Driving Course.** The off-road driving course must be in an area with varied, un-level terrain.
- **Mortar Pits.** The mortar pits must be adjacent to the impact area due to range clearance requirements.
- **DLQ Pad.** The V-22 DLQ pad is required to be elevated to simulate the “in-ground effect” of landing the V-22 on an aircraft carrier. Therefore, the pad must be located near or on a cliff.
- **Small Arms Range.** The small arms range must be on fairly level ground to provide line-of-sight to the targets. The berm for the small arms range must not be located within the impact area because of range clearance requirements.
- **Special Skills Facilities.** The special skills training facilities must be in close proximity to the SOF PEF compound to minimize driving time and traffic on the range. The location of the special skills facilities must also simulate real-world scenarios in which landing zones are located adjacent to mission objectives.
- **DZ Training.** DZ training requires a 10-mile approach to the DZ; therefore, airspace needs to be cleared and uncongested for this approach.

## 2.3 Alternatives Carried Forward for Analysis

Possible alternatives identified by 27 SOCES, 27 SOW/JA, and 27 SOAOS/RMO personnel were evaluated by applying the selection standards described in **Section 2.2** to potential alternatives. Two alternatives to the Proposed Action meet the operational and technical selection standards as described in **Section 2.2** and will be carried forward for the analysis in the EA.

### 2.3.1 Alternative 1 – Alternate Range Configuration

Under Alternative 1, the USAF would implement all projects described under the Proposed Action in **Section 2.1**; however, some projects described in **Section 2.1.1** would be located in alternative locations or would be configured differently than under the Proposed Action. This alternative would allow flexibility in future years as individual projects are approved, funded, and implemented.

Of the proposed construction projects described in **Table 2-2**, only the projects provided in **Table 2-8** would be constructed in alternate locations. **Table 2-8** provides a description of the changes in the proposed project locations under Alternative 1, and **Figure 2-6** depicts the proposed range configuration under Alternative 1. Proposed demolition or abandonment, utilities and fencing, training in the land gift area, reintroduction of explosive munitions in the western target area, and changes in munitions expenditures under Alternative 1 would remain the same as described under the Proposed Action in **Section 2.1**. Additionally, proposed increases in the amount of impervious surfaces and land disturbances would remain the same as described under the Proposed Action in **Table 2-3**.

**Table 2-8. Project Location Changes under Alternative 1**

<b>Project</b>	<b>Proposed Location Change</b>
Off-road Driving Course	Under Alternative 1, the off-road driving course would be located in the southeastern corner of the range, where there is an expanse of open space. However, this location does not provide as varied terrain as the location under the Proposed Action.
Live-Fire Compound and Shoot House	Under Alternative 1, the live-fire compound and shoot house would be moved to the south and not interfere with any other proposed training operations.
DLQ Pad	Under Alternative 1, the DLQ pad would be located adjacent to the range control tower, which is a land area that provides the proper cliff environment to simulate the “in-ground effect” of landing the V-22 on an aircraft carrier. Although viable, this alternative is not preferred because it requires flight patterns to be flown closer to, and within, the SDZs associated with the impact areas.

### **2.3.2 Alternative 2 – Non-explosive Western Target Area**

Under Alternative 2, the USAF would implement all actions described under the Proposed Action in **Section 2.1**, except the USAF would not reintroduce explosive munitions into the western target area as described in **Section 2.1.4**. Alternative 2 would include all other projects described in **Section 2.1**, including demolition and construction, utilities and fencing, training in the land gift area, and changes in munitions expenditures. Under Alternative 2, the western target area would continue to be used for non-explosive munitions training.

## **2.4 No Action Alternative**

CEQ regulations require consideration of the No Action Alternative. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and alternatives can be evaluated. Under the No Action Alternative, Melrose AFR would not be reconfigured as shown in **Figures 2-1 and 2-2** to support more efficient training operations. Specifically, the following actions would not occur under the No Action Alternative:

- Demolition or abandonment of infrastructure in the center of the range
- Construction or relocation of new infrastructure including administrative facilities and training features
- Installation of new utilities and fencing
- Non-renewal of the land gift area agricultural subleases and commencement of specific training activities where training has not previously occurred
- Reintroduction of explosive munitions training in the western target area
- An increase or decrease of some explosive and non-explosive munitions currently expended on Melrose AFR.

However, some projects described in this EA and specifically those identified in **Tables 2-2 and 2-4**, and described in **Section 2.1.6.1** have also been analyzed as part of the Proposed Action in other NEPA documentation. Under the No Action Alternative, these projects could still be implemented under the Proposed Action and analysis of other NEPA documents.



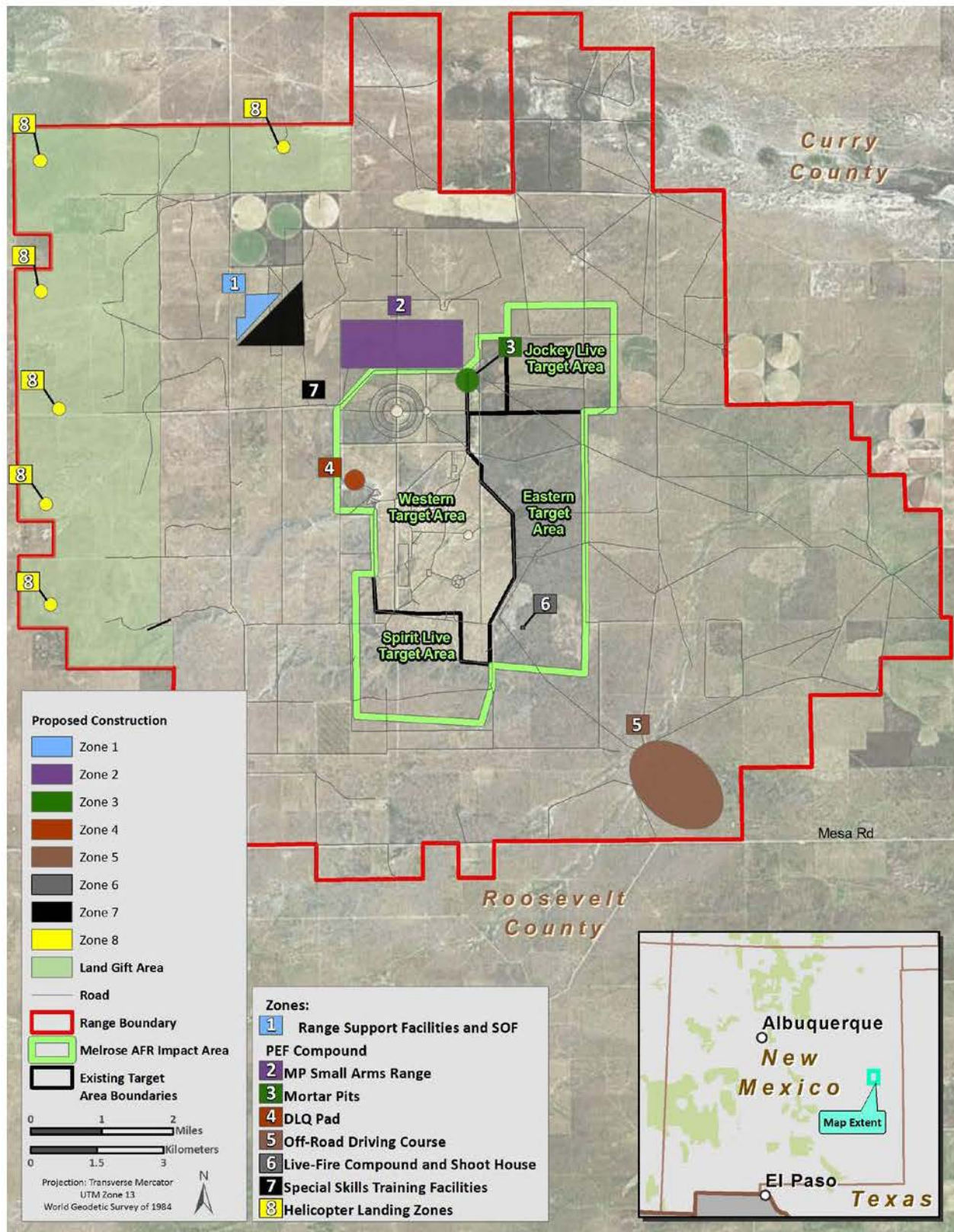


Figure 2-6. Melrose AFR Proposed Configuration under Alternative 1

Under the No Action Alternative, existing training and safety conflicts would continue to occur. The No Action Alternative would not reduce congestion in the center of the range or allow for efficient scheduling of training operations. The alternative would not collocate multiple SDZs and WDZs in a centralized area to support simultaneous training without disrupting other operations on the range. The No Action Alternative would not meet the purpose of and need for the Proposed Action, as described in **Section 1.6**. However, the No Action Alternative is carried forward in detailed analysis in accordance with CEQ NEPA regulations and USAF EIAP requirements.

## **2.5 Alternatives Considered but Eliminated from Detailed Analysis**

Training ranges outside of Cannon AFB and 27 SOW control (i.e., DOD ranges other than Melrose AFR) were considered to support Melrose AFR user training. However, training at other locations would not meet the purpose and need to improve training efficiency at Melrose AFR as described in **Section 1.6** and is therefore not described further in this section. The following alternatives would meet the purpose and need of the Proposed Action, but were eliminated from detailed analysis because they do not meet the selection standards described in **Section 2.2**.

### **2.5.1 Renovate Existing Facilities**

To increase efficiency of Melrose AFR training capabilities, the USAF considered renovating the existing administrative facilities and training ranges, as applicable, rather than conducting construction and demolition. However, renovation of these facilities would not allow for simultaneous training events because of their location. The current administrative facilities and maneuver areas are located within the center portion of the range in close proximity to the danger area, which is the composite of all weapons safety footprints (e.g., SDZs and WDZs) for the range. This configuration severely limits how the range can be used and does not provide collocation of SDZs, WDZs, and impact areas to the greatest extent possible. These facilities and ranges must be relocated instead of renovated to provide a safer and more efficient training environment on the range. Therefore, this potential alternative was considered but dismissed from further analysis.

### **2.5.2 Extend Sublease of Land Gift Area**

The USAF considered an alternative to the Proposed Action in which the land gift area would continue to be subleased to farmers and ranchers. Under this alternative, the subleases would continue in 2015, as described under the Proposed Action in **Section 2.1.3**, and all proposed range design and reconfiguration would occur within the current Melrose AFR operational boundaries. However, this alternative does not meet the selection standard to locate non-hazardous activities on the perimeter of the range to prevent overlap of SDZs on other training areas and allow simultaneous training by multiple users. Therefore, this potential alternative was considered but dismissed from further analysis.

## **2.6 Identification of the Preferred Alternative**

The Preferred Alternative of 27 SOW is to implement the Proposed Action, as described in **Section 2.1**.



### 3. Affected Environment and Environmental Consequences

All potentially relevant resource areas were initially considered for analysis in this EA. In compliance with NEPA, CEQ, and EIAP 32 CFR Part 989 guidelines, the following discussion of the affected environment and environmental consequences focuses only on those resource areas considered potentially subject to impacts and with potentially significant environmental issues. This section includes air quality, noise, geology and soils, water resources, biological resources, cultural resources, land use, hazardous materials and wastes, health and safety, socioeconomics and environmental justice, and infrastructure and utilities.

This section presents a description of the environmental resources and baseline conditions that could be affected from implementing the Proposed Action. In addition, this section presents an analysis of the potential environmental consequences of implementing the Proposed Action, and the consequences of selecting the No Action Alternative. Each alternative was evaluated for its potential impacts on physical, biological, and socioeconomics resources in accordance with CEQ guidelines at 40 CFR Part 1508.8.

The impact analyses consider all alternatives discussed in **Section 2** that have been identified as reasonable for meeting the purpose of and need for action. These alternatives include the following:

- The Proposed Action (described in **Section 2.1**)
- The No Action Alternative (described in **Section 2.4**).

**Sections 3.1 through 3.11** discuss potential environmental and socioeconomic impacts on the affected environment.

#### 3.1 Air Quality

##### 3.1.1 Definition of the Resource

Air quality is measured by the concentration of criteria pollutants in the atmosphere. The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological “air basin,” and the prevailing meteorological conditions in that region.

**National Ambient Air Quality Standards.** The Clean Air Act, as amended, requires the U.S. Environmental Protection Agency (USEPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The USEPA characterizes ambient air quality in terms of compliance with the primary and secondary NAAQS. Primary NAAQS provide public health protection, including protecting the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The USEPA has established NAAQS for six criteria pollutants:

- Carbon monoxide (CO)
- Lead (Pb)
- Nitrogen dioxide (NO<sub>2</sub>)
- Ozone (O<sub>3</sub>), which results from the presence of nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC) in the atmosphere
- Sulfur dioxide (SO<sub>2</sub>)
- Particulate matter (with an aerodynamic size less than or equal to 10 microns [PM<sub>10</sub>] and with an aerodynamic size less than or equal to 2.5 microns [PM<sub>2.5</sub>]).

States may either adopt the NAAQS or establish their own, more stringent standards. The State of New Mexico has adopted the NAAQS and promulgated additional State Ambient Air Quality Standards (SAAQS). In some cases, the SAAQS are more stringent than the Federal standards. **Table 3-1** presents the NAAQS and SAAQS for the federally listed criteria pollutants.

**Attainment Versus Nonattainment.** The USEPA classifies the air quality in a region according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas are therefore designated as either “attainment,” “nonattainment,” “maintenance,” or “unclassified” for each of the six criteria pollutants. Attainment means that the air quality is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation means that there is not enough information to appropriately classify an area, so the area is considered attainment.

**Greenhouse Gas Emissions.** Greenhouse gases (GHGs) are gaseous emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Human-caused GHGs are produced primarily by the burning of fossil fuels and through industrial and biological processes. The most common GHGs emitted from human activities include carbon dioxide (CO<sub>2</sub>), methane, and nitrous oxide.

### 3.1.2 Affected Environment

Melrose AFR is located in Roosevelt and Curry counties, New Mexico, which are designated by the USEPA and New Mexico Environment Department (NMED) as in attainment for all criteria pollutants (USEPA 2015, NMED 2015). Air emissions are produced at the installation from a variety of functions including motor vehicle operation, aircraft training, and munition expenditures during live fire training (Cannon AFB 2010).

### 3.1.3 Environmental Consequences

The environmental consequences on local and regional air quality conditions from a proposed Federal action are determined based upon the increases or decreases in regulated air pollutant emissions and upon existing conditions and ambient air quality. The evaluation criteria are dependent on whether the proposed action is located in an attainment, nonattainment, or maintenance area for criteria pollutants.

**Table 3-1. National and State Ambient Air Quality Standards**

Pollutant	Averaging Time	Primary Standard		Secondary Standard
		Federal	State	
CO	8-hour <sup>(1)</sup>	9 ppm (10 mg/m <sup>3</sup> )	8.7 ppm	None
	1-hour <sup>(1)</sup>	35 ppm (40 mg/m <sup>3</sup> )	13.1 ppm	None
Pb	Rolling 3-Month Average <sup>(2)</sup>	0.15 µg/m <sup>3</sup> <sup>(3)</sup>	None	Same as Primary
NO <sub>2</sub>	Annual <sup>(4)</sup>	53 ppb <sup>(5)</sup>	50 ppb	Same as Primary
	1-hour <sup>(6)</sup>	100 ppb	Same as Federal	None
PM <sub>10</sub>	24-hour <sup>(7)</sup>	150 µg/m <sup>3</sup>	None	Same as Primary
PM <sub>2.5</sub>	Annual <sup>(8)</sup>	12 µg/m <sup>3</sup>	None	15 µg/m <sup>3</sup>
	24-hour <sup>(6)</sup>	35 µg/m <sup>3</sup>	None	Same as Primary
O <sub>3</sub>	8-hour <sup>(9)</sup>	75 ppb <sup>(10)</sup>	None	Same as Primary
SO <sub>2</sub>	1-hour <sup>(11)</sup>	75 ppb <sup>(12)</sup>	None	None
	Annual <sup>(4)</sup>	None	0.02 ppm	None
	3-hour <sup>(1)</sup>	None	None	0.5 ppm
	24-hour Average	None	0.10 ppm	None

Sources: USEPA 2011, State of New Mexico 2002

Notes: Parenthetical values are approximate equivalent concentrations.

- Not to be exceeded more than once per year.
  - Not to be exceeded.
  - Final rule signed 15 October 2008. The 1978 standard for Pb (1.5 µg/m<sup>3</sup> as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved. The USEPA designated areas for the new 2008 standard on 8 November 2011.
  - Annual mean.
  - The official level of the annual NO<sub>2</sub> standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of cleaner comparison to the 1-hour standard.
  - 98th percentile, averaged over 3 years.
  - Not to be exceeded more than once per year on average over 3 years.
  - Annual mean, averaged over 3 years.
  - Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
  - Final rule signed 12 March 2008. The 1997 O<sub>3</sub> standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, the USEPA revoked the 1-hour O<sub>3</sub> standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour O<sub>3</sub> standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.
  - 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
  - Final rule signed 2 June 2010. The 1971 annual (0.3 ppm) and 24-hour (0.14 ppm) SO<sub>2</sub> standards were revoked in that same rulemaking. However, these standards remain in effect until 1 year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.
  - Not to be above this level more than twice in a consecutive 7-day period.
- Key: ppm = parts per million; ppb = parts per billion; mg/m<sup>3</sup> = milligrams per cubic meter; µg/m<sup>3</sup> = micrograms per cubic meter

For attainment areas, a proposed action would be considered significant if the net increases in pollutant emissions would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Exceed any evaluation criteria established by a state implementation plan
- Cause an increase of 250 tons per year (tpy) of any attainment criteria pollutant from mobile sources.

Although the fourth bullet above (i.e., cause an increase of 250 tpy of any attainment criteria pollutant from mobile sources) is not a regulatory driven threshold, it is being applied as a conservative measure of significance in attainment areas. The rationale for applying this conservative threshold to mobile sources is that it is consistent with the threshold for a Prevention of Significant Deterioration major source (i.e., stationary source) in attainment areas.

Because the General Conformity Rule applies only to significant Federal actions in nonattainment or maintenance areas, it is not applicable to this air quality analysis. Therefore, neither an applicability analysis nor a conformity determination is required.

There are no regulatory thresholds of significance for GHG emissions; however, the CEQ has released the *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, which suggests that 25,000 metric tpy of CO<sub>2</sub>-equivalent is a meaningful reference point for when to consider GHG emissions in NEPA documentation. CO<sub>2</sub> emissions are provided in this EA for information and comparison purposes.

### 3.1.3.1 PROPOSED ACTION

#### 3.1.3.1.1 *Demolition and Construction and Utilities and Fencing*

Short-term, minor, adverse impacts on air quality would occur annually from the proposed demolition and construction activities associated with the projects listed in **Tables 2-1** and **2-2** and the proposed construction activities associated with the utilities and fencing projects listed in **Table 2-4**. Air emissions would be produced during each year (i.e., 2015, 2016, 2017, 2018, 2020, and 2025) that demolition and construction activities are planned. As noted in these tables, some projects are planned over a range of many years. For the purposes of this air quality analysis, all demolition and construction activities are assumed to be compressed into the last year of a project's range.

Air emissions from demolition and construction activities would be generated from site-disturbing activities and the operation of heavy equipment (mobile sources). Demolition and construction activities would also generate particulate matter emissions as fugitive dust from ground-disturbing activities and from the combustion of fuels in construction equipment. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of activity. Demolition and construction workers commuting daily to and from the job site in their personal vehicles would also generate regulated pollutant air emissions. Emissions from demolition and construction activities would be produced only for the duration of demolition and construction activities which, for the

purposes of this air quality analysis, is conservatively assumed to be 12 calendar months or 240 workdays for each project.

Demolition and construction activities would incorporate best management practices (BMPs) to minimize fugitive particulate matter emissions. Work vehicles would be well-maintained and newer vehicles (i.e., model year 2007 and later) would use diesel particulate filters to reduce particulate matter emissions.

Demolition and construction activities would contribute directly to emissions of GHGs from the combustion of fossil fuels. The estimated annual emission of CO<sub>2</sub> from demolition and construction would range between 363 and 1,763 metric tpy, which ranges between approximately 1.5 and 7.1 percent of the CO<sub>2</sub>-equivalent meaningful assessment reference point established by the CEQ. Because CO<sub>2</sub> represents the overwhelming majority of GHGs from motor vehicle fuel combustion, an estimate of other GHG emissions converted to CO<sub>2</sub>-equivalent is unnecessary.

An air emissions analysis containing detailed calculations and assumptions was prepared for the proposed demolition and construction activities associated with the projects listed in **Tables 2-1** and **2-2** and the proposed construction activities associated with the utilities and fencing projects listed in **Table 2-4**. **Table 3-2** summarizes the annual demolition and construction air emissions and the applicable significance criteria. In summary, the yearly increase in air emissions from the demolition and construction activities is below applicable significance criteria. Air emissions from the operation of the facilities proposed for construction would not differ greatly or increase from the air emissions currently generated at the existing facilities on Melrose AFR; therefore, a quantitative estimate of operational air emissions is unnecessary.

**Table 3-2. Summary of Annual Demolition and Construction Air Emissions and Applicable Significance Criteria**

Year	NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)	SO <sub>2</sub> (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)	CO <sub>2</sub> (metric tpy)
<b>Annual Air Emissions</b>							
2015	5.157	0.786	4.915	0.382	0.858	0.405	872.982
2016	6.148	1.471	11.490	0.411	24.723	2.847	1,762.874
2017	5.830	1.394	11.343	0.398	8.734	1.236	1,706.717
2018	5.933	1.406	11.394	0.403	3.274	0.694	1,724.811
2020	5.710	1.031	6.915	0.405	2.591	0.606	1,168.053
2025	0.306	0.288	2.767	0.006	0.206	0.039	363.235
<b>Significance Criteria Threshold</b>							
Significance Criteria	250	250	250	250	250	250	25,000

### 3.1.3.1.2 Land Gift Area

No impacts on air quality would occur from the administrative action of not renewing the land gift area leases. No stationary air emission sources would be removed from the land gift area when the private ranchers and ranching companies withdraw from the area. Livestock grazing on the

land gift area would be relocated to other locations, resulting in no net change in GHG emissions.

Long-term, negligible, adverse impacts on air quality would occur from the proposed military training on the land gift area. Most training proposed on the land gift area would not be new training to Melrose AFR, but rather training that has relocated from within the center of Melrose AFR to the land gift area. Examples of relocated training include the use of HLZs, a DLQ pad, and a DZ. As a result, no new air emissions would be produced from the use of these features on the land gift area. The only training proposed on the land gift area that would be new to Melrose AFR is the use of an off-road driving course, and air emissions would be produced from the operation of vehicles on the course. Approximately 2 vehicles (e.g., Humvees, all-terrain vehicles, motorcycles, and MRAPs) would drive the 3-mile course 3 times per day for 5 days per week. This equates to approximately 4,680 total vehicle miles per year. **Table 3-3** provides the estimated annual air emissions from the use of the off-road driving course conservatively assuming all vehicles on the course are light-duty gasoline trucks. The annual air emissions from the off-road driving course are below applicable significance criteria.

**Table 3-3. Annual Air Emissions from the Use of the Off-road Driving Course**

NO <sub>x</sub> (tpy)	VOC (tpy)	CO (tpy)	SO <sub>2</sub> (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)	CO <sub>2</sub> (metric tpy)
0.003	0.004	0.054	<0.001	0.218	0.022	2.415

#### 3.1.3.1.3 Western Target Area

No impacts on air quality would occur from reintroducing explosive munitions training on the western target area. Air emissions from munitions expenditures on the western target area are discussed in the munitions expenditures subsection.

#### 3.1.3.1.4 Munitions Expenditures

Long-term, negligible, beneficial impacts on air quality would occur from the proposed changes in munitions expenditures on Melrose AFR. The proposed changes would slightly reduce annual air emissions from munitions expenditures. **Table 3-4** provides the estimated overall net change in annual air emissions from the proposed changes in munitions expenditures.

**Table 3-4. Net Change in Air Emissions from the Proposed Changes in Munitions Expenditures**

	NO <sub>x</sub> (tpy)	CO (tpy)	Pb (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)	CO <sub>2</sub> (metric tpy)
<b>Net Change</b>	-0.049	-0.133	-0.003	-0.071	-0.011	-2.098

#### 3.1.3.2 ALTERNATIVE 1

The impacts on air quality from Alternative 1 would be the same as those described under the Proposed Action. Identical quantities of criteria and GHG pollutants would be produced from the various alternate range configurations as the Proposed Action. The region of impact for air quality is regional to global in scale; therefore, different configurations of the range would not result in different air quality impacts on local receptors.



### 3.1.3.3 ALTERNATIVE 2

The impacts on air quality from Alternative 2 would be the same as those described under the Proposed Action. No impacts on air quality would occur from not reintroducing explosive munitions training on the western target area.

### 3.1.3.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Therefore, the air emissions in **Table 3-2** would not be produced. No new air emissions would be produced if training does not occur on the land gift area and no changes in existing air emissions would occur if the proposed changes to munitions expenditures do not occur. Therefore, no new impacts on air quality would be expected to occur.

## 3.2 Noise

### 3.2.1 Definition of the Resource

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air, and are sensed by the human ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's *quality of life*, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz are used to quantify sound frequency. The human ear responds differently to different frequencies. "A-weighting", measured in A-weighted decibels (dBA), approximates a frequency response expressing the perception of sound by humans for normal sounds. "C-weighting", measured in C-weighted decibels (dBC), approximates a frequency response expressing the perception of sound by humans for very loud or impulsive noises. Sounds encountered in daily life and their levels are provided in **Table 3-5**.

**Table 3-5. Common Sounds and Their Levels**

Outdoor	Sound Level (dBA)	Indoor
Motorcycle	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringing telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris 1998

The sound pressure level noise metric describes steady noise levels, although very few noises are, in fact, constant; therefore, additional noise metrics have been developed to describe noise including:

- **Equivalent Sound Level ( $L_{eq}$ )** -  $L_{eq}$  is the average sound level in dBA.
- **Sound Exposure Level (SEL)** - SEL is the total energy associated with an acoustic event, as though it was compressed into one second. For sound events that last longer than one second, the SEL value will be higher than other noise metrics.
- **Day-night Sound Level (DNL)** - DNL is the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10:00 p.m. to 7:00 a.m.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. A-weighted DNL is used to assess aircraft noise, C-weighted DNL is used for demolition and heavy artillery noise, and Onset-Rate Adjusted DNL is used for noise from restricted airspace.

The USAF's land use guidelines for noise exposure are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, *Guidelines for Considering Noise in Land-Use Planning and Control*. These guidelines stem from the USEPA 1974 "Levels Document" which suggested continuous and long-term noise in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. **Table 3-6** outlines recommended noise limits for land use planning purposes. Roosevelt County, Curry County, and the Village of Melrose do not maintain noise ordinances; however, the Joint Land Use Study for Cannon AFB and Melrose AFR is consistent with the Air Force's land use guidelines (Curry County NM 2011).

**Table 3-6. Recommended Noise Limits for Land Use Planning**

General Level of Noise	Heavy Artillery and Demolition Noise (CDNL)	Aircraft Noise (ADNL)	Recommended Uses
Low	< 62 dBC	< 65 dBA	noise-sensitive land uses acceptable
Moderate	62–70 dBC	65–75 dBA	noise-sensitive land uses normally not recommended
High	> 70 dBC	> 75 dBA	noise-sensitive land uses not recommended

Source: USAF 2002

dBC = C-Weighted Decibels

dBA = A-Weighted Decibels

CDNL = C-Weighted Day Night Level

ADNL = A-Weighted Day Night Level

### 3.2.2 Affected Environment

Melrose AFR is an active military training range used for both air and ground unit training. Dominant military training noise sources include aircraft maneuvers and air-to-ground and ground-to-ground munitions use. The Region of Influence (ROI) for this analysis includes Melrose AFR and its vicinity, as well as the area beneath SUA Restricted Areas R-5104 and R-5105.

Operations at Melrose are currently in a state of flux as AFSOC assets continue to beddown at Cannon AFB and operations tempo has not reached the level analyzed in the AFSOC Beddown Environmental Impact Statement (EIS). The 2007 EIS included 108 aircraft, but as of 2010, only 45 aircraft were assigned to Cannon AFB. Additional aircraft will continue to beddown at Cannon AFB over the next several years, and the addition of these aircraft will result in steadily increasing operations tempo at Melrose AFR. The 2011 Comprehensive Range Plan incorporated several new Landing Zones and small arms training activities within the range in addition to the activities outlined in the 2007 EIS. This EA considers the end-state conditions as analyzed in the noise sections of the 2011 *Melrose AFR Environmental Assessment for the Comprehensive Range Plan* to be baseline conditions and is hereby incorporated by reference (USAF 2011).

The area surrounding Melrose AFR is characterized by wide, open spaces and relatively low human population density. The predominant land use in the areas surrounding the range is livestock grazing. Noise levels when military training is not underway are typically low, and the sound environment is dominated by natural sounds such as the wind and birds with occasional anthropogenic sounds such as ground vehicle noise. Widely scattered residences and other structures are located in the area adjacent to the range. Noise complaints about training operations at Melrose AFR are relatively infrequent.

**Heavy Artillery.** Wide varieties of air-to-ground and ground-to-ground munitions are currently used at Melrose AFR. A dominant and distinctive noise source at Melrose AFR is munitions fire from the C-130 gunship. The gunship fires 30 mm, 40 mm, and 105 mm ammunition while orbiting at a constant bank angle above the impact areas. The existing 62 dBC DNL noise contour extends approximately five miles from the center of these impact areas - extending approximate 1 mile south, 1 mile west, and 2 miles northeast of the existing range boundary. There are no residences exposed to noise levels greater than 62 dBC DNL (USAF 2011).

**Aircraft and Restricted Airspace.** The most frequent aircraft used at the range are the C-130 (H, W, and J models), CV-22, remotely piloted aircraft, and non-standard aircraft based at Cannon AFB. USAF CV-22 aircraft and certain C-130 variants frequently conduct training activities at low altitudes including landing at existing HLZs and DZs. C-130 gunships and RPA aircraft typically conduct training at relatively high altitudes. Areas beneath R-5104A/B are currently exposed to approximately 56 dBA DNL and areas beneath R-5105 are exposed to approximately 58 dBA DNL. These DNL metrics have been onset-rate adjusted to account for the startle effect of rapidly moving aircraft (USAF 2011). In addition, the 65 dBA ADNL noise contours for existing HLZs extend approximately two miles from the center of the HLZ within the range, and approximately 1 mile off-range along the flight paths for those near the northern boundary of the range. There are no residences exposed to noise levels greater than 65 dBA DNL from existing restricted airspace or HLZs (USAF 2011).

**Land Gift Area.** As outlined above, individuals within and adjacent to the land gift area are currently exposed to multiple sources of noise including military training activities, aircraft operations, vegetation noise, and animal vocalizations. Heavy artillery noise and aircraft overflights would be audible, but distant most of the time, with occasional louder events. These areas would be considered rural or remote, and very quiet during periods without any military training activities. Background noise levels ( $L_{eq}$  and DNL) were estimated for the surrounding

areas using the techniques specified in the American National Standard *Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements with an observer present*. **Table 3-7** outlines as the closest receptors to the proposed HLZs in the land gift area and estimated background noise levels. There are no noise sensitive areas within the range boundary including the land gift area.

**Table 3-7. Estimated Background Sound Levels (dBA)**

Location	Distance [ft (m)]	Direction	Type	Land Use Category	ADNL	L <sub>eq</sub> Daytime	L <sub>eq</sub> Nighttime
HLZ 1	7,385 (2,251)	Northwest	Residential	Rural/Remote	40	38	32
HLZ 1	13,143 (4,006)	Northwest					
HLZ 3	21,066 (6,421)	West					
Pad	13,402 (4,085)	Southwest					

Source: ANSI 2013

### 3.2.3 Environmental Consequences

This EA evaluates changes to existing noise environments that would result from the Proposed Action. Specifically, construction and operational noise associated with the reconfiguration of the range will be addressed. Changes in noise would be considered significant if they were to lead to a violation of any Federal, state or local noise ordinance, or would substantially increase areas of incompatible land use outside the range boundary.

#### 3.2.3.1 PROPOSED ACTION

##### 3.2.3.1.1 Demolition and Construction

Short-term, minor, adverse impacts would be expected. The Proposed Action would require the demolition of existing structures and the construction of new facilities at the Melrose AFR. Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet. With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active demolition and construction sites. **Table 3-8** presents typical noise levels (dBA at 50 feet) that the USEPA has estimated for the main phases of outdoor construction. The zone of relatively high construction noise levels typically extends to distances of 400 to 800 feet from the site of major equipment operations. The proposed demolition and construction sites are located well within the range boundary, and noise generated during these activities would not typically be audible off-range. Given the temporary nature of proposed demolition and construction activities and the distance to any noise sensitive areas, these effects would be minor.

**Table 3-8. Noise Levels Associated with Outdoor Construction**

Construction Phase	Sound Level (dBA) at 50 feet
Ground Clearing	84
Excavation, Grading	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA 1971

Although construction-related noise impacts would be minor, the following BMPs would be performed to further reduce any realized noise impacts:

- Construction would occur primarily during normal weekday business hours
- Construction equipment mufflers would be properly maintained and in good working order.

#### **3.2.3.1.2 Utilities and Fencing**

Short-term, minor, adverse impacts would be expected from utilities and fencing projects. Noise would be similar to that described under **Section 3.2.3.1.1 Demolition and Construction**. The Proposed Action would require the demolition of existing structures and the construction of new facilities at the Melrose AFR. Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet.

#### **3.2.3.1.3 Land Gift Area**

Long-term, minor, adverse impacts would be expected from the establishment of new HLZs, DLQ pad, off-road driving course, and DZ within the land gift area. Areas along the land gift area boundary would be exposed to a substantially greater number of low altitude aircraft overflights and associated noise when compared to existing conditions. Noise levels associated with high-tempo training conditions would exceed 65 dBA DNL along the flight paths approaching and departing the proposed HLZs and extend beyond range boundaries; however, there are no existing residences within these areas. Noise from the proposed off-road driving course and DZ would be distant, but audible, during times of relative quiet. The changes in noise would not lead to a violation of any Federal, state or local noise ordinance, and would not substantially increase areas of incompatible land use outside the range boundary.

**HLZs and DLQ Pad.** Under the Proposed Action, several HLZs and a single DLQ pad would be established within the land gift area. Sources of noise at the HLZs would be consistent with existing activities at Melrose AFR. In the immediate area surrounding HLZs the noise would be dominated by intermittent helicopter and rotorcraft takeoff and landing activities. In total, the seven helicopters and tiltrotor landing areas (i.e., six HLZs and one DLQ pad) could be used for up to six hours per day; or approximately 50 minutes per landing area per day. Helicopters and tiltrotor aircraft would participate in minimal hover time when approaching the landing areas, and dwell time on the ground per landing would be approximately 5 minutes. During this dwell time, the majority of the helicopters or tiltrotor aircraft would remain running.

The NOISEMAP program was used to model noise generated by aircraft operations at the proposed HLZs for a high-tempo “reasonable upper bound” training scenario. This training scenario assumes 20 operations per day at any [or all] of the proposed HLZs and the DLQ pad, with 40 percent of the operations occurring between the hours of 10:00 p.m. and 7:00 a.m. DNL Noise contours associated with this level of aircraft operations are shown **Figure 4-2**. Noise levels exceeding 65 dBA DNL would be along the flight paths approaching and departing the proposed landing areas, and extend approximately two miles beyond range boundaries. There are no existing residences that would be within the 65 dBA DNL contours. These impacts would be considered minor.

Noise levels outlined in **Figure 3-1** represent a reasonable upper bound of impacts, and the actual DNL levels would likely be lower than those shown. Under normal training conditions, the rotorcraft noise would not be sufficient to generate areas of incompatible land use near the proposed HLZs; however, aircraft operations can be loud to individuals under the flight path. The SEL for select aircraft and the number of flyovers at 500 feet above ground level (AGL) that would be required to achieve 65 dBA DNL are outlined in **Table 3-9**. If a single CV-22 flew directly over a noise-sensitive area once per day at 500 feet AGL, the annual DNL would be approximately 41.6 dBA. This would be well below the 65 dBA threshold and would be fully compatible with noise sensitive land uses. It would take 5,814 CV-22 overflights per year (approximately 16 per day) 500 feet directly over an individual receptor to generate an overall sound level of 65 dBA DNL. Given the proposed operational tempo and associated noise at the proposed HLZs and DLQ pad, these impacts would be less than significant.

**Table 3-9. Noise Levels Associated with Individual CV-22 Overflights**

Aircraft	SEL Single Flyover @ 500 Feet AGL	DNL Single Flyover @ 500 Feet AGL	Number of Flyovers to Achieve 65 dBA DNL
CV-22 2	91.0	41.6	5,814

Source: USAF 2013

Note: SEL is the total energy associated with an acoustic event, as though it was compressed into one second, and would be appreciably higher than even the maximum sound level.

Some off-range areas affected by noise levels greater than 65 dBA DNL are used for livestock grazing. Low-altitude overflights could potentially result in behavioral reactions in nearby livestock; however, cattle typically become accustomed to repeated events and show less vigorous reactions with increased repetitions. With the exception of young animals and animals rotated in from other grazing areas, many of the animals in the area should have been exposed to military aircraft overflight noise for several years. These impacts would be considered minor.

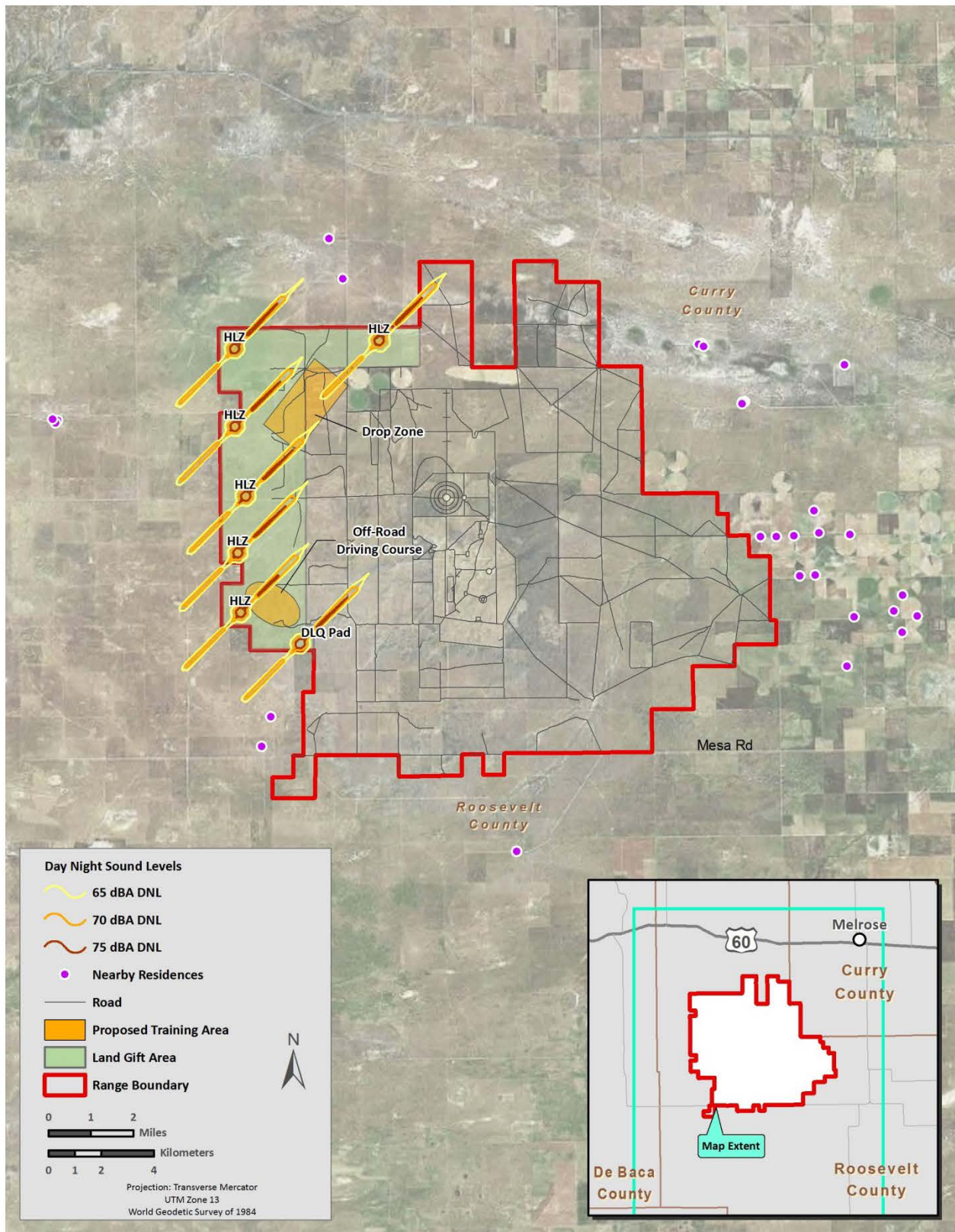
**Off-Road Driving Course.** Ground-based vehicles that would be used at the off-road driving course are substantially quieter than other sources of military noise at Melrose AFR including heavy artillery, aircraft, and small arms. Vehicles would consist mainly of HMMWVs, MRAPs, ATVs and motorcycles which would produce noise levels comparable to on-road heavy trucks and motorcycles. Estimated sound level for these vehicles at the closest point to the range boundary and the nearest residence are outlined in **Table 3-10**.

**Table 3-10. Sound Levels for Vehicles Using the Off-Road Driving Course**

Vehicle Type	Estimated Sound Level (dBA)				
	164 feet (50 meters)	Alternative 1		Alternative 2	
		Range Boundary	Nearest Residence	Range Boundary	Nearest Residence
HMMWVs	64.2	41.6	26.1	51.0	23.4
MRAP	63.1	40.5	25.0	49.9	22.3
ATV/Motorcycle	56.2	33.6	18.1	43.0	15.4

Sources: US Army 2008, US Army 2010, SAE 2008





Source: Noise Contours: LPES, Inc 2015. Aerial Photography: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 3-1. Noise Contours for Proposed Landing Areas

These activities would produce sound levels less than 55 dBA at the range boundary and less than 30 dBA at the nearest residence. Overall noise levels would be below 65 dBA DNL, and would not create any areas incompatible with noise sensitive land uses. Noise would be barely perceptible (i.e., just above background levels) at the range boundary, and inaudible at nearby residences except during periods of extreme quiet. Therefore, these impacts would be considered minor.

**Drop Zone.** Sources of noise at the proposed DZ would be consistent with existing activities at the Melrose AFR. In the immediate area surrounding the DZ, the noise would be dominated by intermittent C-130 overflights, and helicopter and rotorcraft takeoff and landing activities. Under normal training conditions, the rotorcraft noise would not be sufficient to generate areas of incompatible land use near the proposed DZ; however, aircraft operations can be loud to individuals under the flight path. The SEL for C-130s and the number of flyovers at 500 feet AGL that would be required to achieve 65 dBA DNL are outlined in **Table 3-11**. If a single C-130 J per day flew directly over a noise-sensitive area once per day at 500 feet AGL, the annual DNL would be approximately 47.6 dBA. This would be well below the 65 dBA threshold and would be fully compatible with noise sensitive land uses. It would take 3,089 C-130 overflights per year (approximately eight per day) 500 feet directly over an individual receptor to generate an overall sound level of 65 dBA DNL. Although there would be only a marginal change in the overall noise environment at the proposed DZ, noise from individual overflights would generate distinct acoustical events, and have the potential from time-to-time to annoy residents directly under their flight path. Given the expected operational tempo and associated noise at the proposed DZ, these impacts would be considered minor.

**Table 3-11. Noise Levels Associated with Individual C-130 Overflights**

Aircraft	SEL Single Flyover @ 500 Feet AGL	DNL Single Flyover @ 500 Feet AGL	Annual Number of Flyovers to Achieve 65 dBA DNL
C-130H/W	95.0	45.6	3,798
C-130 J	97.0	47.6	3,089

Source: USAF 2007b

**Restricted Airspace.** Long-term, negligible, adverse impacts on the noise environment would be expected from an incremental change in fixed-wing, helicopter, and unmanned aircraft system operations within restricted airspace near the range. The changes in operations and associated noise would be consistent with the existing and historical sources of noise at the restricted airspaces, but would extend more toward the western portions of the range and over the land gift area. Noise levels beneath the restricted airspace would remain unchanged when compared to existing conditions. Areas beneath R-5104A/B would continue to be exposed to approximately 56 dBA DNL and areas beneath R-5105 to 58 dBA DNL. These effects would be negligible.

#### **3.2.3.1.4 Western Target Area**

Long-term, negligible, adverse impacts would be expected from the reintroduction of air-to-ground and ground-to-ground direct fire explosive munitions training in the Western Target Area. Wide varieties of air-to-ground and ground-to-ground munitions are currently used at Melrose AFR, and the change in operations and associated noise would be consistent with the

historical sources of noise at the range. The dominant noise source at Melrose AFR would continue to be munitions fire from the C-130 gunship firing 30 mm, 40 mm, and 105 mm ammunition while orbiting above impact areas. The on-range noise would expand to be consistent with historical noise around the Spirit, Jockey, and the Western Target Areas; however, there would be no appreciable changes in noise outside of the range boundary. The 62 dBC DNL noise contour would continue to extend approximately five miles from the center of the impact areas, extending approximate 1 mile south, 1 mile west, and 2 miles northeast of the existing range boundary. No residences would be exposed to noise levels greater than 62 dBC DNL (USAF 2011).

#### **3.2.3.1.5 Munitions Expenditures**

Long-term, negligible, adverse impacts would be expected. Because noise is measured on a logarithmic scale, two incoherent sources (e.g., heavy artillery noise) of equal level added together would result in an increase of approximately 3 dBA at all distances. Therefore, even a doubling in range-wide munitions expenditures would only increase the noise level by approximately 3 dBA. For example, air-to-ground and ground-to-ground artillery training generating 62 dBC plus the same amount of artillery training in the same impact area would yield a total noise level of approximately 65 dBC. The proposed changes in munitions expenditures would slightly increase the total number of munitions, while reducing the total number of pounds expended. The additional munitions would constitute an incremental change in training, and a less than 1 percent change of the current expenditures. These changes would amount to a change in noise of less than 0.1 dBC for all nearby areas, and no perceptible change to the noise environment. Therefore, these impacts would be considered negligible.

#### **3.2.3.2 ALTERNATIVE 1**

The impacts on noise from Alternative 1 would be the same as those described under the Proposed Action. Identical noise would be produced from the various alternative range component configurations as the Proposed Action. Different configurations of the range components would not result in different noise impacts on local receptors.

#### **3.2.3.3 ALTERNATIVE 2**

The impacts on noise from Alternative 2 would be similar but slightly less than those described under the Proposed Action because explosive munitions would not be fired in the western target area.

#### **3.2.3.4 NO ACTION ALTERNATIVE**

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Therefore, the noise described in **Section 3.2.3.1** would not be produced. No impacts on the noise environment would be expected.

## **3.3 Geology and Soils**

### **3.3.1 Definition of the Resource**

Geologic resources include subsurface and exposed rock materials. Properties of local bedrock affect soil formation and properties, groundwater sources and availability, and terrain. Soils include unconsolidated materials formed from the underlying bedrock or other parent material or



transported from distant sources by way of wind and water. Soils play a critical role in the natural and human environment, affecting vegetation and habitat, water and air quality, and the success of the construction and stability of roads, buildings, and shallow excavations.

### 3.3.2 Affected Environment

Physiographically, Melrose AFR falls within the Southern High Plains, Southwestern Part Major Land Resource Area classification, a southeastward sloping regional plateau that stretches through southeastern New Mexico and a portion of the southwestern panhandle of Texas. This area of New Mexico and west Texas is typified by smooth and gently sloping or undulating surfaces with scattered, normally dry, flat-bottomed depressions forming the dominant relief feature (USDA 2006).

Geology of the area is typified by Quaternary sediments, including lacustrine and playa deposits (Holocene), piedmont alluvial deposits (Holocene to lower Pliocene), eolian sediments of the Blackwater Draw Formation (Pleistocene), and older alluvial deposits. Quaternary sediments are generally underlain by unconsolidated and poorly sorted sands and gravels of the Ogallala Formation (Miocene to Pliocene) (NMBGM 2003). Melrose AFR is underlain by several hundred feet of unconsolidated sediments deposited over sandstone, known as the Triassic redbeds, which form the basement of the Ogallala Aquifer (USDA 2006).

Elevations at Melrose AFR range from approximately 4,200 feet above sea level in the northeast portion to over 4,700 feet above sea level in the southwest portion. Several drainages and small canyons cross the landscape of the Melrose AFR, including Sheep Canyon and Canada del Tule. The largest topographic feature and highest point on Melrose AFR is an unnamed mesa, often referred to as “the Mesa,” a northeast-trending, flat-topped hill rising over 4,700 feet above sea level and located on the southwest side of the range (USAF 2011).

The semi-arid climate of the region contributes to the development of alluvium and thin topsoils with low organic content. Some areas are underlain by caliche, a leached clay-carbonate hardpan consisting of precipitated calcium carbonate that has been solubilized from overlying sediments and soils. Caliche can be difficult to excavate. Within the region, tightly cemented layers of caliche are present in a number of soil horizons as well as in the Ogallala Aquifer (27 SOW 2011, Langman et al. 2004).

There are 49 primary soil associations found on Melrose AFR, ranging from fine sand to loams, with slopes ranging from 0 to 20 percent. Soils on Melrose AFR tend to be low in organic matter, slightly alkaline, and have a low capacity to hold water; therefore ponding or flooding is rarely an issue. Area soils tend to be deep to moderately deep in profile and are moderately well to excessively well-drained. The U.S. Department of Agriculture reports that the area has variable soil permeability, ranging from moderate in loamy soils to high in sandy soils (USDA 2015). Soils are slightly alkaline to alkaline with a typical pH of 7.1 to 8.2, although these pH values can range from 6.6 to 9.0. Soils are typically characterized by coarse-textured materials. The depth to the water table for most soils on Melrose AFR is greater than 80 inches (USDA 2015).

Soils in the northern third of the range are especially susceptible to wind erosion and tend to form dunes in the absence of stabilizing vegetation. Soils in the southern part of the range have

a lower susceptibility to erosion, as they are more compacted. In areas of the range where topsoil is thin and caliche is close to the surface, moderate damage to soil structure is more likely to lead to loss of vegetation. The most dominant soil associations found on Melrose AFR include the following, in descending order of total acreage (USDA 2015, Cannon AFB 2010).

**Springer Loamy Fine Sand.** Consist of very deep, well-drained, moderately to rapidly permeable soils that formed in eolian sediments and alluvium. Surface water runoff is negligible on less than 1 percent slopes, very low on 1 to 5 percent slopes, and low on 5 to 10 percent slopes. These nearly level to hummocky soils are found on interdunes and dunes of sand sheets on stream terraces and alluvial plains. Slopes range from 0 to 10 percent. This association is found primarily in the northern part of the range.

**Clovis Loams.** Consist of very deep, well-drained, moderately permeable soils that formed in medium and moderately fine-textured sediments from quartzite gneiss, schist, sandstone, and limestone. Surface water runoff is negligible on slopes less than 1 percent, very low on 1 to 3 percent slopes, low on 3 to 5 percent slopes, and medium on 5 to 20 percent slopes. Clovis loams are found on fan terraces, piedmont slopes, and plains. Slopes range from 0 to 20 percent.

**Stegall Loams.** Consist of well-drained and moderately deep soils that are moderately to slowly permeable above caliche layers and have a very slow permeability below caliche layers. Surface water runoff is negligible on 0 to 1 percent slopes and very low on 1 to 3 percent slopes. Stegall loams formed in loamy eolian sediments over a layer of indurated caliche that is underlain by loamy calcareous material derived from the Blackwater Draw Formation of the Pleistocene age. Surface water runoff is negligible on less than 1 percent slopes, and low on 1 to 5 percent slopes. Stegall loams are found on broad, smooth, nearly level to very gently sloping plains. Slopes range from 0 to 3 percent.

**Mansker Loams.** Consist of very deep, well-drained, moderately permeable soils that formed in loamy, calcareous eolian sediments derived mainly from the Blackwater Draw Formation of the Pleistocene age. Surface water runoff is negligible on less than 1 percent slopes, low on 1 to 5 percent slopes, and medium on 5 to 8 percent slopes. Mansker loams are found on nearly level to moderately sloping plains. Slopes range from 0 to 8 percent.

**Portales Loams.** Consist of very deep, well-drained, moderately permeable soils that formed in a medium to moderately fine-textured, calcareous, lake-derived sediments of the Pleistocene age. Surface water runoff is negligible on 0 to 1 percent slopes and very low on 1 to 3 percent slopes. Portales loams are found on nearly level to very gently sloping concave plains associated with a playa. Slope ranges from 0 to 1 percent.

**Olton Loams.** Consist of very deep, well-drained, moderately slowly permeable soils that are formed in loamy, calcareous eolian sediments in the Blackwater Draw Formation of the Pleistocene age. Surface water runoff is negligible on 0 to 1 percent slopes, very low on 1 to 3 percent slopes and low on 3 to 5 percent slopes. These soils are found on nearly level to gently sloping plains and the upper side slopes of playas and draws. Slopes range from 0 to 5 percent.



### 3.3.3 Environmental Consequences

#### 3.3.3.1 PROPOSED ACTION

Under the Proposed Action, ground surfaces would be temporarily disturbed due to demolition and construction activities required for the proposed projects. Specific construction limitations and considerations would depend on the type of construction and subsurface materials encountered at each project location.

##### 3.3.3.1.1 *Demolition and Construction*

Short-term, minor, adverse impacts would result from earthmoving activities associated with demolition, construction or renovation of facilities, and road paving/maintenance projects. These activities would excavate soils and expose rock materials, temporarily removing vegetation and exposing soils to wind erosion. Soils could become compacted by vehicular traffic, including vehicles used for construction and during training missions. In general, accelerated erosion of soils could be minimized for demolition, construction, and maintenance projects by siting and designing facilities to take into account soil limitations, employing construction and stabilization techniques appropriate for the soils and climate, and implementing temporary and permanent erosion control measures. Soil compaction could be minimized by planning construction activities, restricting construction traffic to specific areas and routes of travel, and varying off-road travel routes for training missions.

Although soils would be disturbed by earthmoving and other construction activities, any effects would be localized and would not result in significant impacts on soil resources since BMPs, erosion and sediment controls, and other management measures would be implemented. Examples of these BMPs and management measures include minimizing paved areas, maximizing on-site filtration, installing silt fences during construction to keep sediment in place, preserving natural drainage ways, and restricting the use of contaminants that might enter into the environment.

Compliance with the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit would be required if the project area disturbed at any one time totals 1 acre or more. BMPs used to stabilize soils for erosion and sediment control would minimize soil loss from wind erosion by ensuring that temporary measures protect the soil surface.

No additional special qualities for soil and geologic resources are associated with the Proposed Action; therefore, by using BMPs and other preventative measures, potential impacts resulting from construction and demolition activities under the Proposed Action would be minimal and not significant.

##### 3.3.3.1.2 *Utilities and Fencing*

Similar to impacts described in **Section 3.3.3.1.1**, short-term, minor, adverse impacts would result from excavation activities associated with the installation of utilities, removal of existing fencing, and construction of new fencing. These activities would excavate soils and temporarily remove vegetation and expose them to wind erosion. Soils could become compacted by vehicular traffic, including construction vehicles. In general, accelerated erosion could be minimized for utility and fencing projects by taking soil limitations into account, employing construction and stabilization techniques appropriate for the soils and climate, and implementing

temporary and permanent erosion control measures. Although soils would be disturbed by excavation and related construction activities, effects would be localized, temporary, and would not result in significant, long-term, adverse impacts on soil and geologic resources because BMPs, erosion and sediment controls, and other management measures would be implemented.

#### **3.3.3.1.3 Land Gift Area**

Similar to impacts described in **Section 3.3.3.1.1**, short-term, minor, adverse impacts would result from earthmoving activities associated with the construction or leveling of DZ and HLZ sites, the deck landing qualification pad, and road maintenance. These activities would excavate soils and temporarily remove vegetation and expose them to wind erosion. Soils could become compacted by vehicular traffic, including vehicles used for construction and during training missions. Also, use of the off-road driving course would periodically remove vegetation and expose it to wind erosion. In general, accelerated erosion could be minimized for planned grading and maintenance projects by siting and designing those areas to take into account soil limitations, employing construction and stabilization techniques appropriate for the soils and the climate, and implementing temporary and permanent erosion control measures. Adverse impacts resulting from soil compaction could be minimized through traffic planning, restriction of traffic to specific areas and travel routes, and varying off-road travel routes for training missions.

While soils would be disturbed by earthmoving, leveling, and range activities during operations, effects would be localized and would not result in significant impacts on soil or geologic resources because BMPs, erosion and sediment controls, and other management measures would be implemented.

#### **3.3.3.1.4 Western Target Area**

Similar to impacts described in **Section 3.3.3.1.1**, long-term, minor, adverse impacts would result on soil and geologic resources in the western target area through the reintroduction of direct-fire explosive munitions training areas within the range. These impacts could be adverse within localized areas, but are not expected to be significant. Earthmoving for access roads, impact areas, and activities related to explosive munitions training would excavate soils and geologic resources and temporarily remove vegetation and expose them to wind erosion. Soils may become compacted by vehicular traffic, including vehicles used during construction and in tactical training missions; munitions handling; and ordnance impacts. In general, accelerated erosion could be minimized for planned access road construction and maintenance projects by siting and designing these features to take into account soil and geologic material limitations, employing construction and stabilization techniques appropriate for soils and climate, and implementing temporary and permanent erosion-control measures. While soils would be disturbed by grading, maintenance and explosive munitions training, and other related activities, the effects would be localized and would not result in significant impacts on soil and geologic resources because BMPs, erosion and sediment controls, and other management measures would be implemented. Explosive munitions would potentially remove vegetation, create pits or impact craters, and leave areas bare of vegetation. These are minor long-term, adverse impacts that are not anticipated to be significant as they would be localized within designated areas specifically intended for this type of training.

#### **3.3.3.1.5 Munitions Expenditures**

Similar to impacts described in **Section 3.3.3.1.1**, long-term, minor, adverse impacts on soil and geologic resources would result from the potential reconfiguration of Melrose AFR.

Reconfiguration is expected to cause changes in training requirements, capabilities, and effectiveness, as well as munitions expenditures. Earthmoving for access roads, impact areas, and related activities would disturb soils and geologic resources and temporarily remove vegetation and expose them to wind erosion. Soils may also be compacted by vehicular traffic, including vehicles used during construction and in tactical training missions, and by explosive munitions used in training. In general, accelerated erosion could be minimized by designing these features to take into account soil and geologic material limitations, employing and stabilization techniques appropriate for soils and climate, and implementing temporary and permanent erosion control measures. Effects would be localized and would not result in significant impacts on soil and geologic resources because erosion and sediment controls and other management measures would be implemented.

#### **3.3.3.2 ALTERNATIVE 1**

The impacts on soil and geologic resources from Alternative 1 would be similar to those described under the Proposed Action. This alternative would implement all projects described under the Proposed Action; however, some projects would be located in alternative locations or would be configured differently than under the Proposed Action.

#### **3.3.3.3 ALTERNATIVE 2**

The impacts on soil and geologic resources from Alternative 2 would be similar to those described under the Proposed Action, with the exception of not reintroducing explosive munitions on the western target area. This alternative would be very similar to the Proposed Action and its associated impacts would be similar to those discussed under the Proposed Action.

#### **3.3.3.4 NO ACTION ALTERNATIVE**

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Therefore, no new impacts on soil and geologic resources would be expected to occur.

### **3.4 Water Resources**

#### **3.4.1 Definition of the Resource**

Water resources are natural and man-made sources of water that are available for use by and for the benefit of humans and the environment. Water resources relevant to Melrose AFR's location in New Mexico include groundwater, surface water, floodplains, and wetlands. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

**Groundwater.** Groundwater is water that exists in the saturated zone beneath the earth's surface, and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations.

**Surface Water.** Surface water resources generally consist of wetlands (discussed separately here), lakes, rivers, and streams. Surface water is important for its contribution to the economic, ecological, recreational, and human health of a community or locale.

Stormwater is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade surface waters. Proper management of stormwater flows, which can be intensified by high proportions of impervious surfaces associated with buildings, roads, and parking lots, is important to the management of surface water quality and natural flow characteristics.

**Wetlands.** Wetlands are a special category of waters of the U.S. and are subject to regulatory authority under Section 404 of the Clean Water Act and EO 11990, *Protection of Wetlands*. Jurisdictional wetlands are those defined by the U.S. Army Corps of Engineers (USACE) and USEPA as meeting all the criteria defined in the USACE's *Wetlands Delineation Manual* (USACE 1987) and fall under the jurisdiction of the USACE. For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 329).

**Floodplains.** Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters that are subject to periodic or infrequent inundation due to rain or melting snow. EO 11988, *Floodplain Management*, directs Federal agencies to avoid siting within floodplains unless the agency determines that there is no practicable alternative. Flood potential is evaluated by the Federal Emergency Management Agency, which defines the 100-year floodplain as an area within which there is a 1 percent chance of inundation by a flood event in a given year. Risk of flooding is influenced by local topography, the frequency of precipitation events, the size of the watershed above the floodplain, and upstream development.

### 3.4.2 Affected Environment

**Groundwater.** Melrose AFR is underlain by the unconfined Southern High Plains Aquifer in the Ogallala Formation. Regional thickness of the aquifer ranges from where the formation wedges out against older rocks, to as much as 150 feet in parts of Curry County. Groundwater flows generally in an east to southeast direction and the water table slopes at a relatively flat 7 to 15 feet per mile. Most groundwater in the region is considered hard. Minerals most often found in groundwater are calcium magnesium carbonates and bicarbonate sulfates (27 SOW 2011).

Melrose AFR has historically used two wells for water supply purposes, Well 11 and Well 13. Well 11 is a shallow well capable of producing a flow rate of 11 gallons per minute (gpm), while Well 13 is a deep well capable of producing a flow rate of 150 gpm. Neither of these wells is currently used for potable water due to elevated concentrations of perchlorate and arsenic, respectively. Well 11 provides water to a 25,000-gallon underground storage tank (UST) used for fire suppression, and Well 13 is used to supply water for firefighting at Melrose AFR facilities (Cannon AFB 2012). The locations of existing wells on Melrose AFR are shown in **Figure 3-2**.

The U.S. Geological Survey identifies 15 wells at Melrose AFR that were monitored for water quality and water level measurements and 12 wells (nonworking windmills) used to obtain static water level measurements. Within the Southern High Plains Aquifer, sodium/chloride-dominated groundwater was found in the center of the Melrose AFR impact area (Langman et al. 2004). Regional water quality in the Southern High Plains Aquifer is generally good, with total dissolved solids ranging from 250 to 500 milligrams per liter and fluorides ranging from 2.2 to 2.7 milligrams per liter (Cannon AFB 2012).

Recharge to the Southern High Plains Aquifer occurs primarily through precipitation. The recharge rate has been estimated to be very low (0.5 to 0.8 inch/year) and is much lower than the discharge rate. Because of the high evapotranspiration rate and low precipitation, recharge can only occur during cool months, when precipitation may exceed evapotranspiration, or during heavy rainfall events in which the infiltration capacity of the soil is exceeded.

**Surface Water.** There are no major drainageways or perennial streams on Melrose AFR. The predominant water features that are present at Melrose AFR are ephemeral streams within the Mesa Playa basin, Canada del Tule, Sheep Canyon draw, and numerous drainages that carry runoff from the Mesa. These drainages do not typically contribute flow to the river valleys into which they eventually drain (the Red or the Brazos), because most of the precipitation is lost to evaporation and infiltration. Stormwater runoff from the southeastern half of Melrose AFR is generally carried by the Canada del Tule draw and the Mesa is drained from the northeast by the Sheep Canyon drainage. Much of the runoff on Melrose AFR is captured in numerous impoundments that are used as sources of water for livestock. Small playas (i.e., small natural depressions that collect seasonal rains) are present throughout the level portions of Melrose AFR (USAF 2011). The locations of prominent water features on Melrose AFR are shown in **Figure 3-2**.

Surface water runoff is managed through a stormwater system consisting of a combination of swales, inlets, culverts, and pipes currently having adequate capacity to handle flows. Stormwater discharges are managed in compliance with the NPDES requirements for construction activity under a program administered by the USEPA.

**Wetlands.** Melrose AFR has seasonally inundated areas and seasonal aquatic habitats, including several minor surface water features and ephemeral streams and drainages. There are no permanently flooded areas located on the range. Two wetlands are present on the northern end of the land gift area. Both are emergent marsh areas, created from overflows from adjacent wells that have been allowed to naturalize over time. No formal jurisdictional waters of the U.S., including wetlands, are located within Melrose AFR or the land gift area.

**Floodplains.** No 100-year floodplains are located on Melrose AFR (Cannon AFB 2010); therefore this topic will not be discussed further.

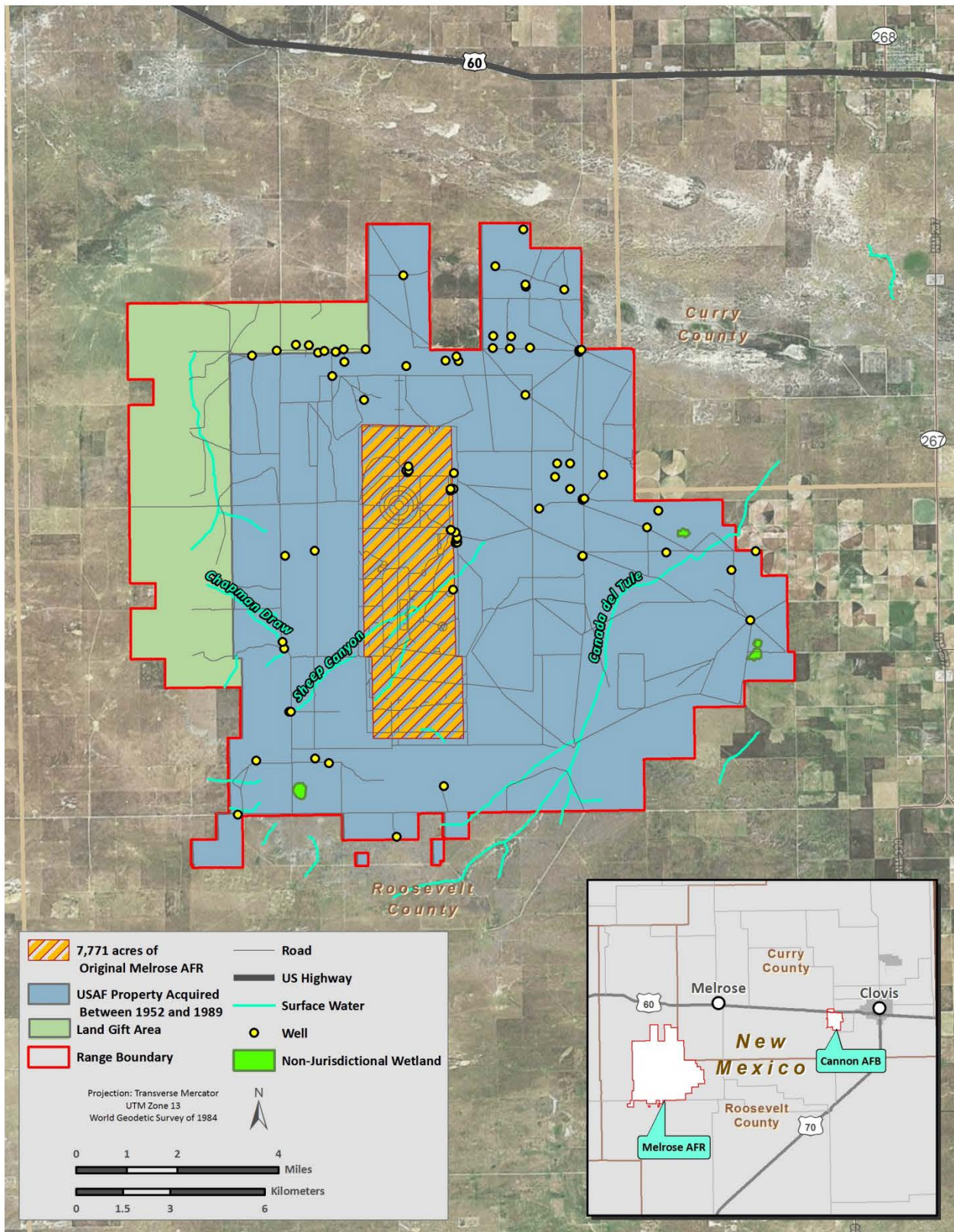
### 3.4.3 Environmental Consequences

#### 3.4.3.1 PROPOSED ACTION

##### 3.4.3.1.1 Demolition and Construction

Long-term, minor, adverse impacts on water resources would occur from the proposed demolition and construction activities associated with the projects listed in **Tables 2-1** and **2-2**.





Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 3-2. Water Resources at Melrose AFR and the Land Gift Area

**Groundwater.** Approximately 14,350 LF of non-potable water lines would be installed underground for fire suppression purposes. Non-potable water supply would include construction of a 250 ft<sup>2</sup> water treatment package facility and a well.

Long-term, minor, indirect, adverse impacts on groundwater would occur from the net increase in impervious surfaces and construction of the proposed off-road driving course in the land gift area. Although the course would not be purposely graded and compacted, it is assumed the course would become compacted over time during use, resulting in a mostly impervious surface. Soil compaction could decrease water infiltration and groundwater recharge.

**Surface Water.** Long-term, minor, direct, adverse impacts on surface water resources would occur from the construction of the DLQ pad and DZ on the land gift area. Approximately 1,286 LF and 6,839 LF of stream would be directly impacted by construction of the DLQ pad and DZ, respectively, in the land gift area. HLZs and the DLQ pad would not be graded or covered with an impervious surface. Additionally, the DZ would not require grading, staking, construction, or additional road access.

Long-term, negligible, indirect, adverse impacts on surface water resources would occur from the proposed construction projects. Potential impacts on surface water resources would result due to a net increase in impervious surfaces, which could lead to increased stormwater runoff. This would be managed through the implementation of control measures to prevent erosion, control sediment loss, and prevent pollutants from entering the system. Use of BMPs and other preventative measures would reduce impacts on surface water resources to negligible. Therefore, no significant adverse impacts on surface water are anticipated.

Long-term, minor, adverse impacts on water resources would occur from construction of the proposed off-road driving course in the southern portion of the land gift area. Approximately 275 LF of streams would be directly impacted by construction of the course. Off-road vehicle use could also result in soil disruption and compaction. Soil compaction could increase runoff and cause erosion issues. The tracks of these vehicles, especially on erosion-sensitive soil surfaces, could form continuous channels, which could grow into continuous gullies with continued use. Surface changes would alter runoff hydrology and result in increases of overland sediment transport capacity and accelerated erosion. Use of BMPs and other preventative measures would avoid or reduce impacts.

**Wetlands.** No wetlands would be impacted by the proposed demolition and construction activities.

#### **3.4.3.1.2 Utilities and Fencing**

Long-term, minor, adverse impacts on water resources would occur from the proposed construction activities associated with the utilities and fencing projects listed in **Table 2-4**.

**Groundwater.** No groundwater would be impacted by the installation of utilities and fencing, or the removal of existing fencing. All underground utilities would be installed approximately 4 feet below the surface and would not impact groundwater.

**Surface Water.** Short-term, negligible, adverse impacts on surface water would occur from the installation of the utilities and fencing on Melrose AFR or the land gift area. It is assumed a

30-foot-wide corridor would be required for the installation of each linear utility and fencing. Total area of disturbance would be approximately 3,376,450 ft<sup>2</sup> (77.5 acres). All activities would be localized and confined to the immediate vicinity of the work site. Soils disturbed during construction would be stabilized to prevent erosion and use of BMPs would reduce impacts to negligible. Therefore, no impacts to surface water resources are anticipated.

**Wetlands.** No wetlands would be impacted by the installation of utilities and fencing, or the removal of existing fencing.

#### **3.4.3.1.3 Land Gift Area**

No impacts on water resources would occur from the non-renewal of the leases or from the proposed training activities on the land gift area. Upon landing during each training operation at the DLQ pad, only minor foot or wheeled ground maneuver would occur in the land gift area.

#### **3.4.3.1.4 Western Target Area**

Reintroduction of explosive munitions in the western target area would not result in impacts on water resources.

#### **3.4.3.1.5 Munitions Expenditures**

Changes in munitions expenditures under the Proposed Action would not result in impacts on water resources.

### **3.4.3.2 ALTERNATIVE 1**

Under Alternative 1, the USAF would implement all projects described under the Proposed Action in **Section 2.1**; however, some projects would be located in alternative locations or would be configured differently than under the Proposed Action. The impacts on water resources from Alternative 1 would be similar to, but less than, those described under the Proposed Action. The off-road driving course would result in 4,921 LF of impacts to streams; however, the DLQ pad and the live-fire compound would not impact water resources. The net increase in impervious surfaces and land disturbances would remain the same as described under the Proposed Action.

### **3.4.3.3 ALTERNATIVE 2**

Impacts on water resources under Alternative 2 would be the same as those described under the Proposed Action. Under Alternative 2, the USAF would implement all actions described under the Proposed Action in **Section 2.1**, except the USAF would not reintroduce explosive munitions into the western target area. This would have no impacts on water resources on Melrose AFR or the land gift area.

### **3.4.3.4 NO ACTION ALTERNATIVE**

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Therefore, no new impacts on water resources would be expected to occur.



## 3.5 Biological Resources

### 3.5.1 Definition of the Resource

Biological resources associated with the Proposed Action and Alternatives includes those native or naturalized plants and animals and the habitats (e.g., wetlands, forests, and grasslands) in which they exist that reside, or might occur, in some transient fashion on Melrose AFR and the land gift area and could be affected by project-related impacts such as ground disturbance caused by construction or operations. The definition includes plants, wildlife, and their habitats within potential effects areas.

### 3.5.2 Affected Environment

**Vegetation.** Vegetation includes existing terrestrial plant communities but does not include special-status plants, which are discussed under **Protected Species**. In addition to serving as habitat for a variety of wildlife, vegetation provides ecosystem services ranging from wind and water erosion control, scenic and recreational value, flood regulation, fuel and other raw materials, regulation of the local climate, and purification of air and water.

**Melrose AFR.** Melrose AFR lies within the Southwest Plateau and Plains Dry Steppe and Shrub Province ecoregion (Bailey 1995). The landform is flat to slightly rolling with natural communities dominated by shortgrass prairie vegetation. Scattered shrubs and small trees grow where soils are deeper and more moisture collects. Historically, the area was used primarily for livestock grazing and cultivated fields, but military use of Melrose AFR over the last 60 years has altered features of the habitats with the greatest changes to the natural grasslands as evidenced on the impact area in the center of the range. The impact area is disturbed frequently by the heavy machinery required for target maintenance (e.g., grading, bulldozing) and from wildfires. The area also includes two borrow pits for soil extraction.

The predominant vegetative land cover at Melrose AFR (including the land gift area) is grassland (see **Figure 3-3**), with the shortgrass prairie as the dominant type of grassland (Parmenter et al. 1994). Shortgrass prairies support blue grama (*Bouteloua gracilis*) and hairy grama (*B. hirsuta*) as co-dominants in several vegetation classes along with tobosa (*Hilaria mutica*), sand dropseed (*Sporobolus cryptandrus*), buffalograss (*Buchloe dactyloides*), mesquite (*Prosopis* spp.), and soaptree yucca (*Yucca elata*) (Parmenter et al. 1994). Areas of land disturbance and former croplands have been invaded with non-natives, including Russian thistle (*Salsola kali*), and other plants that respond to bare soils or sparsely vegetated areas. The Integrated Natural Resource Management Plan describes the habitat types on Melrose AFR in detail (Cannon AFB 2010).

**Land Gift Area.** In December 2013, habitat and species surveys were conducted to examine species composition and to map community types throughout the land gift area (USAF 2013). The dominant community types on the land gift area were the mesquite scrubland and soapweed yucca (*Yucca glauca*) grasslands communities.

**Mesquite Scrubland/Grassland.** Mesquite scrubland habitats are located throughout the central portion of the land gift area. This area appears to have once been a shortgrass prairie in which mesquite (*Prosopis glandulosa*) has invaded. The individual mesquite plants range in maturity and height (mainly 3 to 5 feet tall) and are the dominant species in this habitat type. The

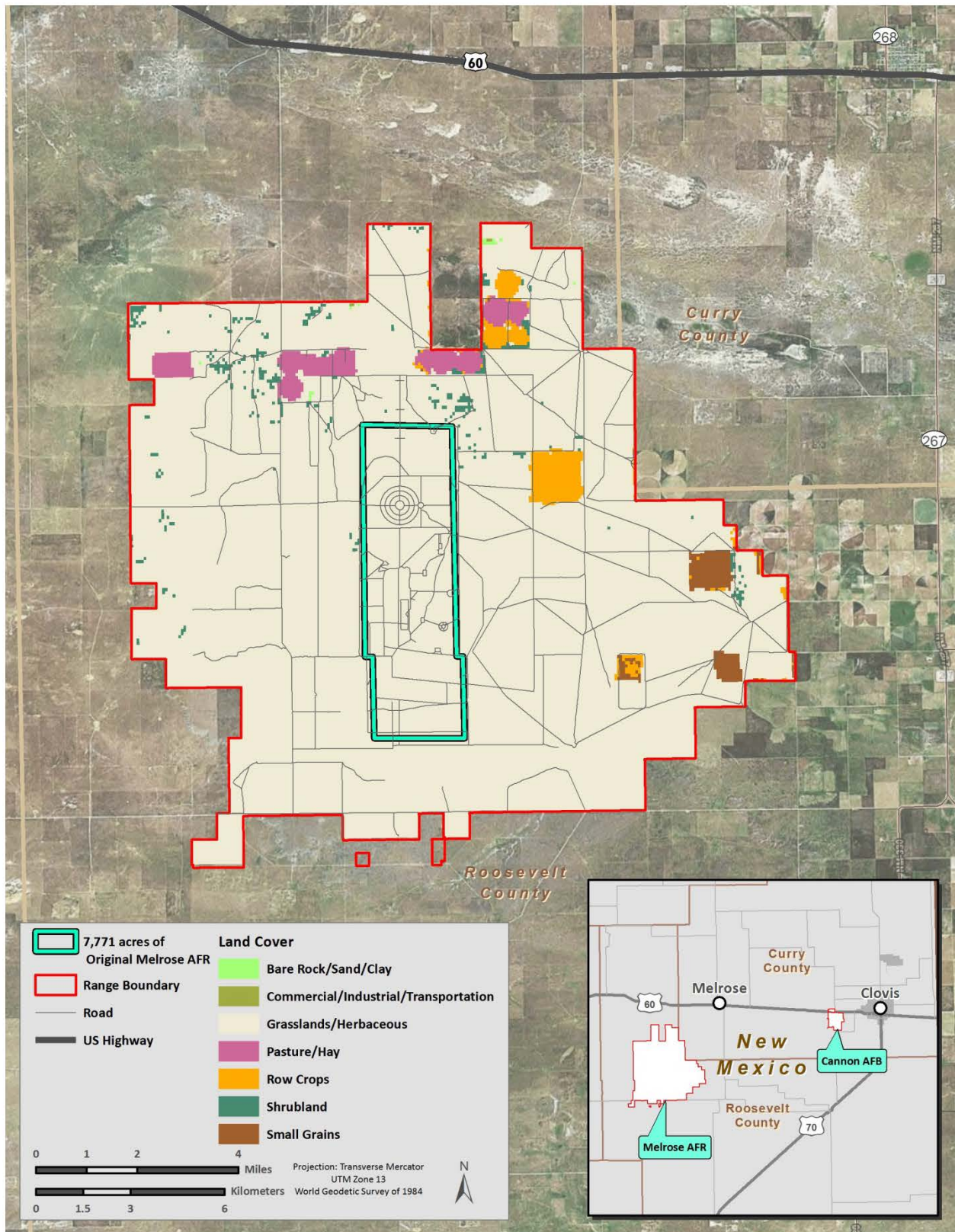


Figure 3-3. Land Cover Types at Melrose AFR and the Land Gift Area



mesquite is generally growing as closely spaced clusters or closed canopied stands. Mesquite density will increase over time as disturbance and fire suppression efforts also increase. The mesquite canopy influences neighboring vegetation, soils, subcanopy microclimate, wildlife, and insect populations. High densities of mesquite suppress grass growth and can reduce understory species diversity.

*Soapweed Yucca Grasslands.* This habitat is dominated primarily by soapweed yucca and grass species typical of the shortgrass prairies.

Two wetlands are present on the northern end of the land gift area. Both are emergent marsh areas, created from overflows from adjacent wells that have been allowed to naturalize over time. The vegetation surrounding the wetlands are comprised of a monoculture of common rush (*Juncus effusus*). The upland vegetation surrounding the wetland is dominated by soapweed yucca, honey mesquite, and silverleaf nightshade (*Solanum elaeagnifolium*).

**Wildlife.** Wildlife includes all invertebrate and vertebrate animal species, with the exception of special-status species, which are discussed under **Protected Species**. Typical wildlife includes animal groups such as large and small mammals, songbirds, waterfowl, reptiles, amphibians, and fish. The attributes and quality of available habitats influence the composition, diversity, and abundance of wildlife communities.

**Melrose AFR.** As part of an inventory of vertebrate species found on Melrose AFR, plant communities were classified according to their value to wildlife (Parmenter et al. 1994). General wildlife habitat types identified include mixed-species grasslands, mesquite grasslands/shrublands, sand-hill shrublands, swales/playas (e.g., depressions), and old agricultural fields.

Habitat generalists commonly found throughout the range include mourning dove (*Zenaida macroura*), common nighthawk (*Chordeiles minor*), western meadowlark (*Sturnella neglecta*), lark sparrow (*Chondestes grammacus*), horned lark (*Eremophila alpestris*), Cassin's sparrow (*Aimophila cassinii*), ornate box turtle (*Terrapene ornate ornate*), western hognose snake (*Heterodon nasicus*), coachwhip (*Masticophis flagellum testaceus*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), silky pocket mouse (*Perognathus flavus*), northern grasshopper mouse (*Onychomys leucogaster*), Ord's kangaroo rat (*Dipodomys ordii*), coyote (*Canis latrans*), and American pronghorn (*Antilocapra americana*) (Parmenter et al. 1994, Cannon AFB 2010). Large mammals (e.g., pronghorn antelope, mule deer, white-tailed deer, coyote) have been surveyed and mapped annually since 2007 (Cannon AFB 2010).

Species recorded from the mixed-species grassland on Melrose AFR include chipping sparrow (*Spizella passerina*), spotted ground squirrel (*Citellus spilosoma*), hispid pocket mouse (*Perognathus hispidus*), six-lined racerunner (*Cnemidophorus sexlineatus*), many-lined skink (*Plestiodon [Eumeces] multivirgatus*), burrowing owl (*Athene cunicularis*), black-tailed prairie dog (BTPD) (*Cynomys ludovicianus*), yellow mud turtle (*Kinosternon flavescens*), mountain plover (*Charadrius montanus*), and sandpipers (Scolopacidae) (Parmenter et al. 1997, USAF 1997, Cannon AFB 2010).

The mesquite-grasslands/shrublands were occupied by scaled quail (*Callipepla squamata*), northern flicker (*Colaptes auratus*), southern plains woodrat (*Neotoma micropus*), and the side-blotched lizard (*Uta stansburiana*). Lower species diversity, primarily vertebrates, was found in

the sandhills habitats. Swale/playa habitats are very small habitats where natural depressions collect seasonal rains and are, therefore, very important for wildlife in this arid area. These habitats, which can contain dense stands of grasses and forbs that vary with moisture amounts, are predominantly located in the northeast and southwest portions of the range. This habitat type is used by many species when water is present including green toad (*Bufo debilis*), white-faced ibis (*Plegadis chihi*), shorebird species, and other migratory waterfowl. Wildlife species also have access to numerous ponds, impoundments and stock tanks set up for livestock inside the leased area. Old agricultural fields supported an abundance of seed-producing annual forbs, which, in turn attracted an exceptional number of granivorous wildlife species such as birds and rodents (Parmenter et al. 1994, Parmenter et al. 1996).

**Land Gift Area.** In December 2013, habitat and species surveys were conducted to examine species composition and to map habitat types throughout the land gift area. Eighty-five avian species, 16 herpetological species, and 21 mammal species were observed during surveys (USAF 2013).

In general, the wildlife associated with the land gift area is typical of a short grass prairie. Black-tailed jackrabbit, American pronghorn, coyote, and Ord's kangaroo rat are common mammals. Mourning dove, horned lark, and ravens (*Corvus* spp.) are common birds. Reptiles commonly occurring in the short-grass prairie are western coachwhip, ornate box turtle, and Texas horned lizard (*Phrynosoma cornutum*) are common reptiles in terrestrial habitats. Aquatic habitats will have a variety of avian species utilizing them including blue-winged teal (*Anas discors*), killdeer (*Charadrius vociferus*), and American avocet (*Recurvirostra americana*). The herpetofaunal species using wetland habitats include barred tiger salamander (*Ambystoma tigrinum mavortium*) and yellow mud turtle (USAF 2013).

**Protected Species.** Protected species are defined as those plant and animal species afforded protection by various Federal and state regulations. The term "federally listed" refers to species that have been designated by U.S. Fish and Wildlife Service (USFWS) pursuant to Endangered Species Act (ESA) as endangered or threatened. Although they are afforded no protection under the ESA, candidate species are also of concern to Federal agencies because they are warranted for listing but precluded by higher listing priority actions. The term 'Birds of Conservation Concern' (BCC) is a USFWS designation for birds that are not ESA-listed as threatened or endangered, but which are high conservation priorities.

Many states, including New Mexico, maintain their own species conservation programs and list species under their own special status definitions, tiers, or groups. USAF policy, as expressed in AFI 32-7064, Section 8.1.2, is to protect and conserve state-listed species "when practicable" (e.g., when not in direct conflict with the military mission).

Federally and state-listed threatened, endangered, or candidate species that occur in Curry and Roosevelt counties are presented in **Table 3-12**; however, not all of these species have suitable habitat at Melrose AFR. Although these species could potentially be found on Melrose AFR, the likelihood of their occurrence is classified as unlikely to transitory. Species with a low likelihood of incidental occurrence are not discussed further.

**Table 3-12. Potentially Occurring Endangered, Threatened, Species of Concern, State Sensitive Taxa, and Candidate Species in Curry and Roosevelt Counties, New Mexico**

Common Name	Scientific Name	Status	Preferred Habitat	Possible Occurrence on Melrose AFR/Land Gift Area
<b>Birds</b>				
Golden Eagle	<i>Aquila chrysaetos</i>	BCC	Specialized (cliffs)	Possible; Wintering occurrence in county, have been observed on Melrose AFR.
Baird's Sparrow	<i>Ammodramus bairdii</i>	ST	Migration and Winter: desert to upland grasslands	Unlikely; No foraging or breeding habitat present on Melrose AFR.
Sprague's Pipit	<i>Anthus spragueii</i>	FC	Migration and Winter: medium to short grass prairies	Possible; Potential habitat is present.
Short-eared Owl	<i>Asio flammeus</i>	BCC	Shortgrass Prairie, Meadows	Possible; Wintering occurrence in county.
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>	BCC	Nesting: Prefers prairie dog towns in open, short-grass prairies. Migration and Winter: Mammal burrows and artificial structures (drains) in open habitats	Likely; Known to breed and are a common resident in mixed-grassland habitats of Melrose AFR.
Lark Bunting	<i>Calamospiza melanocorys</i>	BCC	Shortgrass Prairie, Shrub-steppe	Possible; Breeding and wintering occurrence in county.
Swainson's Hawk	<i>Buteo swainsoni</i>	BCC	Plains/Basin Riparian	Possible; Breeding occurrence in county.
McCown's Longspur	<i>Calcarius mccownii</i>	BCC	Shortgrass Prairie	Possible; Wintering occurrence in county, have been observed on Melrose AFR.
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	BCC	Shortgrass Prairie	Possible; Wintering occurrence in county have been observed on Melrose AFR.
Snowy Plover	<i>Charadrius alexandrinus</i>	BCC	Wetlands	Possible; Breeding and migrating occurrence in county.
Mountain Plover	<i>Charadrius montanus</i>	SST, BCC	Short vegetation mixed with bare ground on flat terrain during breeding, migration and winter Nesting: short-grass prairie on flat and gently sloping topography with sparse vegetation cover (>30% bare ground and very short grass <2 inches Migration and Winter: alkali flats, plowed or burned fields, fallow fields	Possible; Although suitable nesting habitat exists, use of the range appears to be limited to transient use during spring migration (March and April).

Common Name	Scientific Name	Status	Preferred Habitat	Possible Occurrence on Melrose AFR/Land Gift Area
<b>Birds (continued)</b>				
Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	FT, SST	Nesting: eastern subspecies nests in dense thickets near water, second growth woodland; western subspecies in cottonwood/willow riparian forest, mesquite/salt cedar Migration: primarily woodlands	Unlikely; no potential habitat.
Grace's Warbler	<i>Dendroica graciae</i>	BCC	Mature pine forests.	Unlikely; Breeding occurrence in county but no potential habitat.
Prairie Falcon	<i>Falco mexicanus</i>	BCC	Specialized (cliffs)	Possible; Wintering occurrence in county.
Peregrine Falcon	<i>Falco peregrinus anatum</i>	ST	Nesting: high cliffs, bluffs, slopes, cut-banks, building ledges with nearby abundant prey Migration and Winter: areas with abundant prey	Possible; have been observed on Melrose AFR.
Whooping Crane	<i>Grus americana</i>	FE, SE	Migration: found in marshes and prairie potholes in the summer.	Unlikely; no potential habitat.
Bald Eagle	<i>Haliaeetus leucocephalus alascanus</i>	ST, BCC	Nesting: tall living tree near water with nearby forage resources Migration and Winter: riparian systems; known to wander plains to deserts looking for carrion in the winter	Unlikely; no potential habitat.
Mississippi Kite	<i>Ictinia mississippiensis</i>	BCC	Riverine forest, open woodland, and prairies near riparian woodland; regularly in wooded suburbs in some portions of range.	Possible; Breeding occurrence in county.
Loggerhead Shrike	<i>Lanius ludovicianus</i>	SST, BCC	Nesting, Migration, and Winter: grasslands interspersed with shrubs for perching and nesting	Likely; Occurs as a resident on Melrose AFR
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	BCC	Plains/Basin Riparian, Low Elevation Conifer	Possible; Breeding and wintering occurrence in county.
Lewis's Woodpecker	<i>Melanerpes lewis</i>	BCC	Low Elevation Conifer, Plains/Basin Riparian	Possible; Wintering occurrence in county.
Long-billed Curlew	<i>Numenius americanus</i>	BCC	Shortgrass Prairie, Meadows	Possible; Breeding occurrence in county, have been observed on Melrose AFR.
Varied Bunting	<i>Passerina versicolor</i>	ST	Nesting: dense stands of mesquite ( <i>Prosopis</i> spp.) and associated growth in canyon bottoms.	Possible; Occurs in Roosevelt County in the spring.

Common Name	Scientific Name	Status	Preferred Habitat	Possible Occurrence on Melrose AFR/Land Gift Area
<b>Birds (continued)</b>				
Least Tern	<i>Sternula antillarum athalassos</i>	FE, SE	Nesting: sand bars in rivers, playa lakes, gravel roof tops near rivers, ponds; availability of forage fish in proximity of nesting area Migration: Rivers, ponds, marshes, and coast line habitats	Unlikely; no potential habitat.
Lesser Prairie-Chicken	<i>Tympanuchus pallidicinctus</i>	FT, SST, BCC	Arid natural grasslands with interspersed shrubs 3 feet tall or less; in New Mexico, mostly in grassland with shinnery oak	Possible; Previously considered resident and recorded in 2007-2008; however, no individuals were discovered or heard during 2013.
<b>Mammals</b>				
Ringtail	<i>Bassariscus astutus flavus</i>	SST	Usually less than one half mile from perennial water in rocky areas and cliffs in grassland and woodland	Unlikely; no potential habitat.
Least Shrew	<i>Cryptotis parva</i>	ST	Dense ground cover in mesic habitats	Unlikely; no potential habitat.
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	SST	Grassy plains and prairie ecosystems	Likely; Four small active prairie dog colonies were found and mapped during the 2009 survey.
Eastern Red Bat	<i>Lasiurus borealis</i>	SST	Migratory: riparian corridors, primarily with large overstory trees; sometimes desert scrub	Unlikely; no potential habitat.
Sandhill White-tailed Deer	<i>Odocoileus virginianus texana</i>	SST	Sandhills with scattered trees and shrubs	Possible; have been observed on Melrose AFR.
Western Spotted Skunk	<i>Spilogale gracilis</i>	SST	Rocky and brushy areas in desert, grassland, and montane areas	Unknown
Swift Fox	<i>Vulpes velox</i>	SST	Short to mid-grass prairie with sufficient prey availability	Possible; May be present on Melrose AFR; observed during surveys on the land gift area
Red Fox	<i>Vulpes vulpes fulva</i>	SST	Mixed shrub, sagebrush, pinyon/juniper, juniper, and agriculture habitats interspersed with farms and pastures, and margins of urban areas	Likely present on Melrose AFR.
<b>Reptiles</b>				
Dunes Sagebrush Lizard	<i>Sceloporus arenicolus</i>	SE	Sand dune habitat with shinnery oak	Unlikely; no potential habitat.

Sources: Federal status and BCC: USFWS 2015, state status: BISON-M 2015

FE=Federal endangered; FT=Federal threatened; FC=Federal candidate; SE=state endangered; ST=state threatened; SST=state sensitive taxa; BCC=Bird of Conservation Concern



**Melrose AFR.** Seven studies with relevance to endangered, threatened, and candidate species, and species of concern have been conducted on Melrose AFR since 2003, and details of their findings are outlined in the 2010 Integrated Natural Resources Management Plan (Cannon AFB 2010). Lesser prairie-chicken (LPC) (*Tympanuchus pallidicinctus*) is the only federally listed species recorded at Melrose AFR; however, it was not listed at the time of the surveys, and was not recorded during the 2013 surveys. See **Table 3-12** for a list of species with potential to occur on Melrose AFR.

**Land Gift Area.** No federally listed threatened or endangered species were found during 2013 surveys of the land gift area (USAF 2013). The swift fox, a state-sensitive species, was observed during faunal inventory surveys on the land gift area (USAF 2013). See **Table 3-12** for a list of species with potential to occur on the land gift area.

**Plants.** The New Mexico Energy, Minerals and Natural Resources Department Forestry Division has authority over state-protected plant species in New Mexico. According to the agency database, no rare plants are known to occur in Roosevelt or Curry counties (NMRPTC 2015).

**Migratory Birds.** Several bird species present (not listed under ESA, but protected under the Migratory Bird Treaty Act [MBTA]) include ferruginous hawk (*Buteo regalis*), white-faced ibis (*Plegadis chihi*), loggerhead shrike (*Lanius ludovicianus*), Cassin's sparrow, chestnut-collared longspur (*Calcarius ornatus*), lark bunting (*Calamospiza melanocorys*), long-billed curlew (*Numerius americanus*), McCown's longspur (*Calcarius mccownii*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), and the western burrowing owl (Parmenter et al. 1994, Cannon AFB 2010).

Some are summer residents and nest on the range and others are spring/fall migrants. Wide-ranging birds and birds with long migrations such as the bald eagle (*Haliaeetus leucocephalus alascanus*), American peregrine falcon (*Falco peregrinus anatum*), and whooping crane (*Grus americana*) could periodically visit grassland or playa habitats on Melrose AFR, but are not known to breed or winter there. BCC with the potential to occur on Melrose AFR are included in **Table 3-12**. The following species have the potential to occur, either as residents or transients, on Melrose AFR and the land gift area.

The LPC is a federally listed threatened species, Federal BCC, and a state sensitive species (USFWS 2015, BISON-M 2015). This species is a year-round resident in mixed grass-dwarf shrub communities that occur on sandy soils; principally in the sandsage habitats. LPC were first observed during surveys on Melrose in April 1991. A lek, an area where animals such as the LPC perform courtship behavior, was discovered on 4 April 2007 during annual Melrose AFR surveys. In April 2008, a second lek site was found approximately 0.5 mile northwest of the original lek site. No leks were discovered and no LPC were heard during an April 2013 survey.

The loggerhead shrike (*Lanius ludovicianus*) is a state sensitive species and Federal BCC that occurs in Curry and Roosevelt counties (BISON-M 2015). Habitat includes open country with scattered shrubs, trees, and grasslands. This species occurs as a resident on Melrose AFR.

The mountain plover (*Charadrius montanus*) is a state sensitive species and Federal BCC that occurs in Curry and Roosevelt counties (BISON-M 2015). Habitat includes shortgrass prairie, sparse vegetation, and bare ground including grazed areas, cultivated lands, and prairie dog colonies. Mountain plovers were not detected during the 1993 and 1994 breeding season surveys of Melrose AFR, but were observed between 1997 and 2002 (Parmenter et al. 1994, Cannon AFB 2010).

The varied bunting (*Passerina versicolor*) is a state threatened species in Roosevelt County. In New Mexico the species seems to prefer dense stands of mesquite (*Prosopis* spp.) and associated growth in canyon bottoms (BISON-M 2015). Varied buntings are present in the spring in Roosevelt County.

The western burrowing owl (*Athene cunicularia hypugaea*) is a Federal BCC (BISON-M 2015). This species prefers shortgrass, disturbed soils, and prairie dog colonies for winter and breeding habitat. The number of nests on the range varies annually, so the total number of nests on the range is unknown. Burrowing owls are frequently observed in the mixed grassland habitat types and other open or disturbed areas at Melrose AFR. Nesting burrows are frequently found in prairie dog towns or in association with other burrowing mammals such as badgers (Cannon AFB 2010).

The BTPD (*Cynomys ludovicianus*) is a state sensitive species for both Curry and Roosevelt counties (BISON-M 2015). A majority of the BTPD population on Melrose AFR was extirpated by the plague (*Yersinia pestis*) from 2005 to 2006, so burrowing owls are currently using the burrows in former prairie dog towns (Cannon AFB 2010). Four small, active prairie dog colonies were found and mapped during the 2009 survey.

The red fox (*Vulpes vulpes fulva*) is a state sensitive species that is known to occur in both Curry and Roosevelt counties (BISON-M 2015). This habitat generalist is known to occur in urban areas as much as rural areas, which makes this omnivore likely to occur in the project area.

The swift fox (*Vulpes velox*) is a state sensitive species in both Curry and Roosevelt counties (BISON-M 2015). The swift fox is distributed throughout the western Great Plains from central Texas to south-central Canada, including New Mexico from the Pecos River Valley eastward. Swift foxes are often associated with BTPD, an important food source. The swift fox may be present on Melrose AFR and has been observed during surveys on the land gift area.

The western spotted skunk (*Spilogale gracilis*) is a state sensitive species in Roosevelt County (BISON-M 2015). The spotted skunk has been recorded in a big spectrum of habitats varying from open lowlands to mountainous areas, streams to rocky places, beaches to human buildings and other disturbed areas, and chaparral among others (IUCN 2015).

### 3.5.3 Environmental Consequences

#### 3.5.3.1 PROPOSED ACTION

##### 3.5.3.1.1 Demolition and Construction

Short- and long-term, minor, adverse impacts on biological resources would occur from the proposed demolition and construction activities associated with the projects listed in **Tables 2-1** and **2-2**.

**Vegetation.** Site locations for the proposed demolition activities are either currently occupied by existing buildings or are located in semi-improved areas that consist largely of annual weeds, early successional perennials, and some native grasses and shrubs with areas of bare ground. The dominant vegetation type to be impacted by the proposed construction activities is grassland/herbaceous (see **Table 3-13**). In most cases 100 percent of the impacts would occur on grassland/herbaceous vegetation. The off-road driving course, special skills training facilities, HLZs, and the DZ would impact shrublands; however, that vegetation type represents less than 5 percent of the total impact acreage at all of those sites. Although some permanent loss of habitat within the construction footprints would occur, the majority of impacts associated with construction are considered short term. HLZs and the DLQ pad would not be graded or covered with an impervious surface. Additionally, the DZ would not require grading, staking, construction, or additional road access. Therefore, no significant adverse impacts on vegetation are anticipated.

**Table 3-13. Summary of Vegetation Impacts Associated with the Proposed Construction on Melrose AFR and the Land Gift Area.**

General Vegetation Type	Impacts (in Acres) by Construction Project								
	Range Support	Small Arms	Mortar Pits	DLQ Pad	Driving Course	Live-fire	Special Skills	HLZ	DZ
<b>Preferred Alternative</b>									
Grassland/herbaceous	100.1	737	56.7	41.1	611.6	41.8	278.9	103.6	1,263.6
Shrubland	0	0	0	0	10	0	10.2	4.5	8.2
<b>Alternative 1</b>									
Grassland/herbaceous	100.1	737	56.7	41.2	760.6	2.1	278.9	103.6	-
Shrubland	0	0	0	0	0	0	10.2	4.5	-

**Wildlife.** Noise and physical disturbance during demolition and construction activities could result in adverse impacts on wildlife. Increased disturbance or possible mortality of less-mobile species could occur as the result of unavoidable impacts associated with construction activities. Depending on timing, some species that may not be able to move out of the area may lose eggs, nestlings, juveniles, and possibly adults. Some permanent loss of habitat within the construction footprints would occur. Species that occur in the area have been exposed to past and ongoing military activities and many would be expected to be able to adjust to new uses.

It is assumed that any wildlife species utilizing the mixed-species grasslands and the mesquite-grasslands/shrublands would be impacted by the proposed construction activities. Most wildlife present on Melrose AFR and the land gift area are generalist species that are not dependent upon specific habitats and would likely be able to shift their use of habitats and then potentially return to their typical territories and travel corridors. Therefore, no significant adverse impacts on wildlife are anticipated.

**Protected Species.** No federally or state-listed threatened or endangered species are known to inhabit the project sites. Because of the heavily disturbed nature of the sites, there is little wildlife currently inhabiting the demolition sites. The proposed sites are not suitable for quality wildlife habitat and consequences for threatened and endangered species from demolition and construction would be less than significant.

Short-term, minor, adverse impacts on protected species would occur in the areas proposed for construction. The proposed off-road driving course would be sited in an area with documented observations of western burrowing owls and approximately 2.7 acres of documented BTPD towns. The live-fire compound would be sited in an area with documented observations of western burrowing owls and approximately 41.8 acres of documented BTPD towns. Burrowing owls vary their nesting sites from year to year. They are frequently observed in the mixed grassland habitat types and other open or disturbed areas at Melrose AFR. During demolition or construction activities, there is the possibility that a nest could be disturbed. The designation BCC, which applies to the burrowing owl, carries no legal requirement but identifies those species that deserve special consideration in management and planning.

The MP small arms range would be sited within 27 acres of suitable LPC habitat, surrounding Lek 1, a previously identified but no longer active lek (**Figure 3-4**). As previously discussed, LPC surveys were conducted in 2013 and no leks were discovered and no LPC were heard during any surveys.

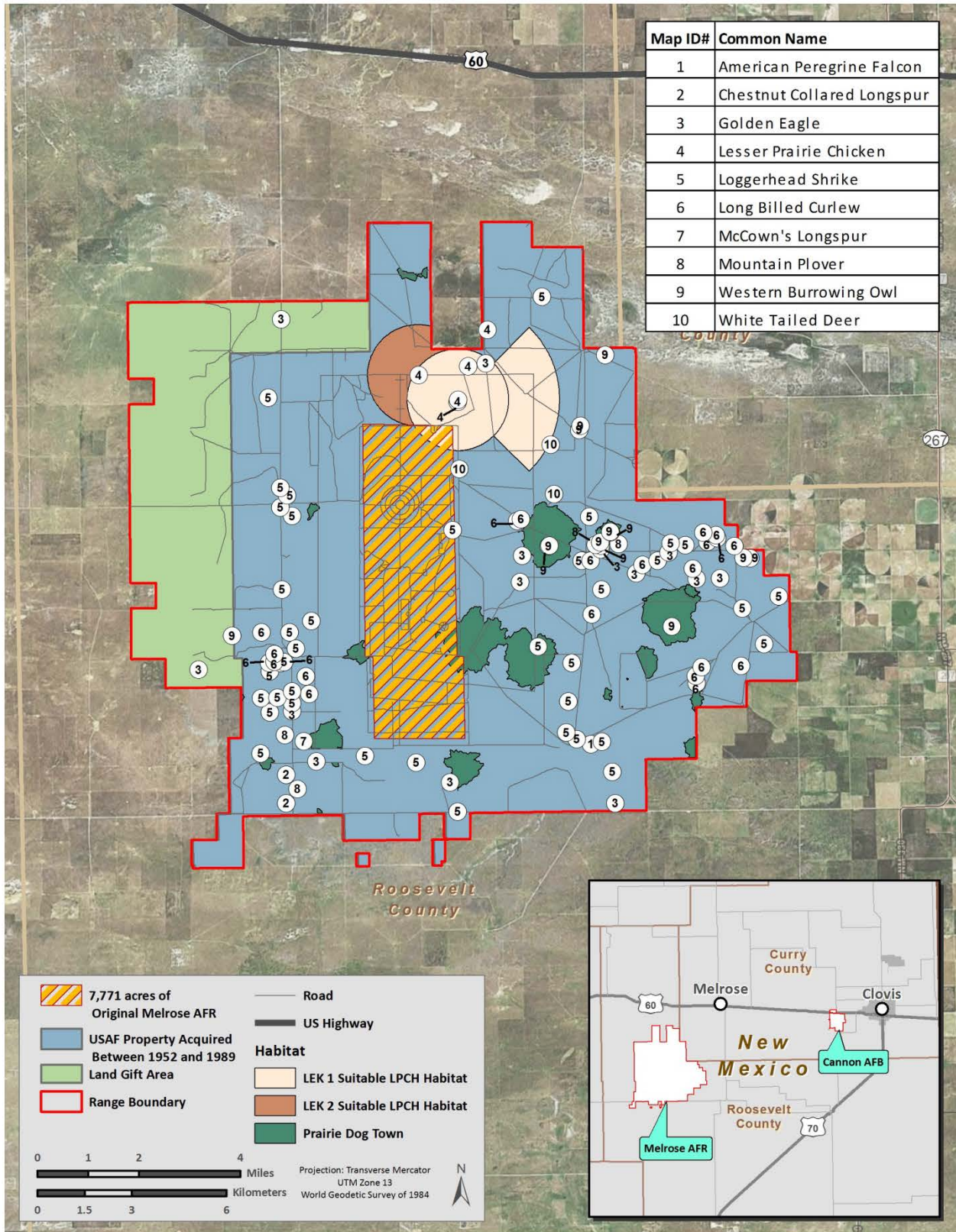
To avoid impacts to BCC and species protected under the MBTA, a survey would be conducted prior to any demolition or construction activities. If birds are present, construction and demolition activities would only commence after the birds have migrated from the area (i.e., 15 October–15 March). Nests would be flagged and avoided during demolition activities, so that the nesting sites could still be viable after activities are completed. These avoidance and minimization measures would avoid the majority of unintentional take of protected bird species.

Therefore, any impacts to MBTA-protected birds or BCC would be expected to be less than significant.

#### **3.5.3.1.2 Utilities and Fencing**

Long-term, minor, adverse impacts on biological resources would occur from the proposed construction activities associated with the utilities and fencing projects listed in **Table 2-4**. Disturbance associated with the installation of the utilities and fencing would be temporary in nature.





Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**Figure 3-4. Protected Species Observations and Habitat on Melrose AFR and the Land Gift Area**



**Vegetation.** The temporary impacts from demolition and construction activities would be localized and confined to the immediate vicinity of the work site and would not disturb the entire area.

**Wildlife.** Any displaced wildlife would be expected to temporarily move to adjacent, less-utilized habitat and then potentially return to their typical territories and travel corridors. Impacts on wildlife from noise and physical disturbance associated with fence and utilities installation activities would be similar to those described under construction and demolition.

A fence would be erected around the perimeter of the land gift area. The fence, approximately 83,000 LF, would be metal, wire, or wood, or a combination of these materials. Depending on the materials to be used, the fence could act as an impediment to wildlife travel corridors. This barrier could prevent movement and dispersal of wildlife species, particularly large mammals, in the land gift area.

#### **3.5.3.1.3 Land Gift Area**

Long-term, minor, adverse impacts on biological resources would occur from the proposed military training and non-renewal of subleases on the land gift area. Following non-renewal of the agricultural subleases on the land gift area and completion of appropriate construction, the USAF would begin using the area for training purposes. Under the Proposed Action, the majority of current helicopter and tiltrotor training would now occur at the HLZs, DLQ pad, and DZ in the land gift area rather than within the center of Melrose AFR. The only training proposed on the land gift area that would be new to Melrose AFR is the use of an off-road driving course.

**Vegetation.** Currently, there are rotational cattle grazing operations on the land gift area through Cannon AFB's agricultural outlease program. Under the Proposed Action, all four subleases would not be renewed in September 2015. An important benefit of the rangeland management program is the reduction of fire hazards. Cattle are estimated to consume at least half of the biomass produced on the installation each year (Cannon AFB 2010). Although elimination of grazing on the land gift area would be beneficial for habitat, if allowed to accumulate, the biomass could result in larger and more intense fires, which could reduce native vegetation and habitat for wildlife species inhabiting the land gift area.

An off-road driving course would be staked (not graded) in the southern portion of the land gift area. Vehicles would practice maneuvering through the natural terrain, including through ditches. Off-road vehicle use could result in reduced perennial and annual plant cover and density, and the overall aboveground biomass. Increased disturbance could also result in the spread of invasive species including saltcedar (*Tamarix ramosissima*) and Siberian elm (*Ulmus pumila*), both of which have been observed in the land gift area. There is also an increase in potential for crushing of vegetation.

**Wildlife.** Impacts on wildlife from noise associated with training activities would be similar to those described under construction and demolition. There would be no increase in helicopter or tiltrotor (e.g., CV-22) flights and landings on the range beyond current levels. Although aircraft would be training for up to 6 hours a day, hover time when approaching the landing areas would be minimal, and dwell time on the ground per landing would be negligible (approximately 5 minutes). Additionally, only minor foot or wheeled ground maneuvers would occur upon landing

in the land gift area. The DZ would not be used for landings by any aircraft and there would be no aircraft hovering. There is also an increase in potential for vehicle collisions with wildlife as a result of the training activities at the off-road driving course.

**Protected Species.** A swift fox, a state sensitive species, was observed in the vicinity of a proposed location for an HLZ. This area has a high density of honey mesquite, which is not habitat typically preferred by swift fox.

Bird species protected under the MBTA that occur in the area have been exposed to past and ongoing military activities and many would be expected to be able to adjust to changes in the locations of these training sites. Habitat is similar across most of Melrose AFR and the land gift area, so it is expected that these species would utilize adjacent habitat during demolition and construction activities and then return to the area.

#### **3.5.3.1.4 Western Target Area**

Long-term, minor, adverse impacts on biological resources would occur from reintroducing explosive munitions training on the western target area. Under the Proposed Action, the range reconfiguration would include the reintroduction of air- and ground-to-ground direct fire explosive munitions training in the western target area.

**Vegetation.** The overall acreage of land designated as impact area for explosive munitions would increase under this element of the Proposed Action, which would likely increase disturbance to vegetation.

**Wildlife.** Non-explosive munitions training currently occurs in the western target area, so it is likely that wildlife have adapted to the noise and disturbance associated with munitions training within the impact area or have already abandoned the habitat in the western target area. However, there is a possibility of increased disturbance to wildlife associated with direct fire explosive munitions.

**Protected Species.** There are no federally or state-listed species, or habitat in the existing impact area.

#### **3.5.3.1.5 Munitions Expenditures**

No impacts on biological resources would occur from the proposed changes in munitions expenditures on Melrose AFR.

#### **3.5.3.2 ALTERNATIVE 1**

The impacts on biological resources from Alternative 1 would be similar to, but less adverse than those described under the Proposed Action. Under Alternative 1, the USAF would implement all projects described under the Proposed Action in **Section 2.1**; however, some projects would be located in alternative locations or would be configured differently than under the Proposed Action. The habitat at the alternative locations is similar to that of the Proposed Action; however, the acreage impacted is slightly less. The proposed off-road driving course would be sited in an area with documented observations of peregrine falcon and loggerhead shrike.

### 3.5.3.3 ALTERNATIVE 2

The impacts on biological resources from Alternative 2 would be similar to, but less adverse than those described under the Proposed Action. Under Alternative 2, the USAF would implement all actions described under the Proposed Action in **Section 2.1**, except the USAF would not reintroduce explosive munitions into the western target area.

### 3.5.3.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Biological resources at the site would generally remain the same as that of baseline conditions, with the exception of those changes in habitat that result from natural succession. Therefore, no new impacts on biological resources would be expected to occur.

## 3.6 Cultural Resources

### 3.6.1 Definition of the Resource

NEPA requires consideration of impacts to cultural resources (40 CFR Part 1508.8). “Cultural resources” is an umbrella term for many types of resources, including prehistoric and historic archaeological sites; historic buildings, structures, and districts; and human-made or natural features important to a culture, a subculture, or a community for traditional, religious, or other reasons. Cultural resources are typically subdivided into archaeological resources; architectural resources; or resources of traditional, religious, or cultural significance to Native Americans or other groups.

- *Archaeological resources* are sites where prehistoric (defined as prior to the invention or introduction of writing) or historic human activity has left physical traces such as artifacts, the remains of structures, or other features such as hearths, but no structures remain standing.
- *Architectural resources* are buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance, such as standing buildings and bridges.
- *Resources of traditional, religious, or cultural significance* to Native Americans or other groups, including traditional cultural properties (TCPs). These resources may include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

Treatment of cultural resources is also governed by other Federal laws and regulations, including the National Historic Preservation Act (NHPA) of 1966, the Archeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). Federal agencies’ responsibility for protecting historic properties is defined primarily by Sections 106 and 110 of the NHPA. Section 106 requires Federal agencies to take into account the effects of their undertakings on historic properties in accordance with 36 CFR Part 800. Section 110 of the NHPA requires Federal agencies to establish, in conjunction with the Secretary of the Interior, historic preservation programs for the identification, evaluation, and

protection of historic properties. State, local, and territorial laws may also apply to the consideration and protection of cultural resources.

In practice, NEPA analyses focus on properties that are listed in, eligible for listing in, or potentially eligible for inclusion in the National Register of Historic Places (NRHP), the official listing of properties significant in United States history, architecture or engineering, or prehistory. The list was established under the NHPA and is administered by the National Park Service on behalf of the Secretary of the Interior. Cultural resources that are listed in or eligible for listing in the NRHP are “historic properties” as defined by the NHPA. The NRHP may include properties on both public and private land. Properties can be determined eligible for listing in the NRHP by Secretary of the Interior or by consensus of a Federal agency official and the applicable State Historic Preservation Office (SHPO). An NRHP-eligible property has the same protections as a property listed in the NRHP. Properties that have not been evaluated for NRHP eligibility are treated as eligible until a final determination can be made.

### 3.6.2 Affected Environment

What is now Melrose AFR has been inhabited since at least 10,500 BC. Researchers divide the area’s prehistory and history into four periods: Paleoindian (ca. 10,500 – 5,500 BC); Archaic (5,500 BC – AD 200); Ceramic (AD 200 – 1800); and Historic (1800 – present). The Paleoindian period is characterized by large, frequently fluted projectile points associated with a highly mobile hunter-gatherer culture that focused on hunting large Pleistocene mammals. The archaeological site within Blackwater Draw that confirmed the presence of human beings in North America during the Pleistocene epoch is 40 miles from Melrose AFR. The subsequent Archaic period is still associated with high mobility, but also with a change to a broader range of foraged foods and the appearance of new technologies such as ground stone plant processing tools. The Ceramic period marks the appearance of several technologies more commonly associated with Pueblo groups to the west: brownware pottery, small projectile points, and a more sedentary lifestyle that depended in part on horticulture. The Historic period saw the introduction of manufactured goods and domesticated animals and use of the area by a diverse range of peoples from the Querecho, Comanche, Kiowa, Lipan Apache, Spanish, Mexican, and Anglo-American cultures. Intensive settlement by European-based cultures did not begin until the late 1800s (Cannon AFB 2010). A brief history of Melrose AFR is provided in **Section 1.3**.

Melrose AFR has been surveyed for archaeological resources, and more than 240 archaeological sites on Melrose AFR have been recorded as a result of these efforts (27 SOW 2011). These sites include 42 NRHP-eligible prehistoric archaeological sites and 21 NRHP-eligible historic archaeological sites (USAF 2009). A survey of the land gift area in 2015 identified 39 additional archaeological sites, including 12 NRHP-eligible historic archaeological sites and 1 NRHP-eligible archaeological site with both historic and prehistoric components (De Cunzo et al. 2015). Previous research indicates that Paleoindian and Archaic sites are most often found in drainages, while Ceramic period sites are most often found in playa basins and drainages and historic period sites are most commonly found on gentle slopes, drainages, and mesa tops (27 SOW 2011).

All historic buildings and structures at the installation have been surveyed and evaluated, including Cold War-era resources, and no additional evaluations of standing structures will be required until 2042. Historic structures surveys have identified no NRHP-eligible architectural

resources, at Melrose AFR. No TCPs or sacred sites have been identified at Melrose AFR. The installation has consulted with the Comanche Tribe of Oklahoma, the Kiowa Tribe of Oklahoma, the Apache Tribe of Oklahoma, the Jicarilla Apache Tribe, and the Mescalero Apache Tribe (USAF 2009).

### 3.6.3 Environmental Consequences

Under NEPA, impacts on cultural resources are assessed as short-term or long-term; direct or indirect; and minor, moderate, or significant. Under Section 106 of the NHPA, the Proposed Action might have no effect, no adverse effect, or an adverse effect on historic properties. As noted above, NEPA analysis of impacts on cultural resources is often integrated with analysis of effects under Section 106 of the NHPA, which states that “(a)n adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.” Specifically, adverse effects on historic properties can include any of the following:

- Physically altering, damaging, or destroying all or part of a resource.
- Altering characteristics of the surrounding environment that contribute to the resource’s significance.
- Introducing visual or audible elements that are out of character with the property or that alter its setting.
- Neglecting the resource to the extent that it deteriorates or is destroyed.
- The sale, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property’s historic significance.

For the analysis of the potential impacts of the Proposed Action on cultural resources, the area of potential effect includes both direct effects such as ground-disturbing activity, and indirect effects resulting from undertakings outside of site locations such as effects to a resource’s viewshed. Impacts on cultural resources include potential effects on buildings, sites, structures, districts, and objects eligible for or included in the NRHP; cultural items as defined in the Native American Graves Protection and Repatriation Act; archaeological resources as defined by the Archaeological Resources Protection Act of 1979; and archaeological artifact collections and associated records as defined by 36 CFR Part 79.

#### 3.6.3.1 PROPOSED ACTION

In planning locations for projects included under the Proposed Action (see **Section 2.1**) as the Preferred Alternative, the Cannon AFB Cultural Resources Manager (CRM) consulted the known archeological and isolate database for Melrose AFR. With the exception of installing perimeter fencing in the land gift area, proposed locations for projects were sited away from known NRHP-eligible archaeological sites. Proposed fencing in the land gift area would cross two NRHP-eligible historic archaeological sites. However, fence installation is a low impact activity and the USAF would implement measures to avoid adverse impacts to the sites. During fence installation, the USAF would avoid vehicle traffic within the site boundary and would install



individual fence posts away from important archaeological deposits or features. All activities under the Proposed Action would follow the standard operating procedures for inadvertent discoveries and other relevant provisions of the Cannon AFB ICRMP (USAF 2009). Therefore, no significant impacts on cultural resources are expected.

In accordance with Section 106 of the NHPA, the USAF consulted on the project with the NM SHPO, the NM Land Office, and the NM Bureau of Indian Affairs. The USAF also invited the Apache Tribe of Oklahoma, the Comanche Nation of Oklahoma, the Jicarilla Apache Nation, the Kiowa Tribe of Oklahoma, and the Mescalero Apache Tribe to consult on the project. As part of the consultation, the NM Land Office requested a copy of the 2015 survey report of the land gift area (De Cunzo et al. 2015), which the USAF provided. The USAF concluded that projects under the Proposed Action would have no adverse effects on historic properties. The SHPO concurred with this assessment in a letter dated December 30, 2015.

Although the project was determined as having no adverse effect, Cannon AFB personnel would continue to consult with the NM SHPO, the NM Land Office, and Native American tribes regarding individual projects as they are funded or otherwise ready to implement. The CRM would reinvestigate the location prior to any ground-disturbing activity. If any previously unrecorded or unevaluated resources are identified, they would be recorded and evaluated for NRHP eligibility. If it is not possible to avoid an NRHP-eligible resource, impacts would be minimized and/or mitigated in accordance with the ICRMP and Section 106 of the NHPA. The NM SHPO concurred with this approach in their letter dated December 30, 2015.

#### **3.6.3.2 ALTERNATIVE 1**

Under Alternative 1, Zone 4 would be moved from the land gift area to a location adjacent to the western target area. In addition, Zone 5 would be moved to the southeast corner of the installation and out of the land gift area. Lastly, Zone 6 would be moved to the south.

Zone 4 and Zone 5 under Alternative 1 are located in the vicinity of known archaeological sites. Zone 6 is located away from known archaeological sites. Impacts to cultural resources resulting from remaining project locations would be consistent with those discussed under the Proposed Action. Proposed fencing in the land gift area would intersect two NRHP-eligible historic archaeological sites; however, measures would be implemented to avoid adversely impacting the sites. No other proposed projects would occur near known NRHP-eligible sites.

As under the Proposed Action and in compliance with Section 106 of the NHPA and other laws and regulations, the USAF would consult with the New Mexico SHPO prior to initiating ground-disturbing actions for each individual project under Alternative 1. To the maximum extent practical, facilities would be sited to avoid areas in which cultural resources are known to exist as shown in the site surveys of cultural resources at Melrose AFR. The USAF would follow the standard operating procedures outlined in the ICRMP including consulting with the SHPO regarding resource eligibility and, if necessary, developing a management plan that may include mitigations for adverse impacts to eligible resources. Therefore, no significant impacts on cultural resources would be expected.

### 3.6.3.3 ALTERNATIVE 2

Under Alternative 2, the USAF would implement all actions in the same locations as those described under the Proposed Action. However, under Alternative 2 the USAF would not reintroduce explosive munitions into the western target area. Therefore, the impact analysis for the Proposed Action provided in **Section 3.6.3.1** is also applicable to Alternative 2, and no significant impacts on cultural resources would be expected.

### 3.6.3.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Therefore, no new impacts on cultural resources would be expected to occur.

## 3.7 Land Use

### 3.7.1 Definition of the Resource

Land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in master planning and local zoning laws. Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms for human activity land uses often include residential, commercial, industrial, agricultural, institutional, and recreational.

In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its permanence.

### 3.7.2 Affected Environment

Melrose AFR is located approximately 25 miles west of Cannon AFB in Roosevelt and Curry counties of east-central New Mexico (see **Figure 1-1**). Melrose AFR, including the land gift area, consists of 70,978 acres of USAF-owned or -administered land. The USAF owns 60,010 acres, and the 10,968-acre land gift area is owned by the State of New Mexico but is leased to and administered by the USAF. The USAF has in turn leased the land gift area to local ranchers through four separate agreements (Cannon AFB 2014).

The USAF-owned portions of Melrose AFR are classified into two areas: the Operational Training Area and Hazard Area. Both areas are accessible only to authorized USAF employees and contractors. The Operational Training Area supports non-explosive military training such as DZs, an airfield, the Electronic Warfare Complex, a Terrorist Training Village, and Counter Improvised Explosive Device Training Areas. The Hazard Area is mainly used for explosive

munitions training but also contains the Range Support Complex, which is an administrative area (Cannon AFB 2014). The proximity of this administrative complex to the impact areas and air-to-ground target complexes (e.g., western target area, Spirit, and Jockey), WZDs, and SDZs causes range congestion and does not allow for efficient scheduling of simultaneous training operations.

The *Comprehensive Range Plan, Melrose AFR, New Mexico*, last updated in October 2014, provides the necessary planning information to guide the future development of Melrose AFR (Cannon AFB 2014). The Comprehensive Range Plan provides the locations of key development constraints such as Air Installation Compatible Use Zone (AICUZ), Accident Potential Zones (APZs), Clear Zones (CZs), Explosive Safety Quantity Distance (ESQD) arcs, and the Hazard Area.

The general region surrounding Melrose AFR is rural and primarily used for agriculture and ranching. The area contains only a few small population centers such as the small towns of Melrose and Floyd to the north and east of the installation, respectively. There is virtually no development apart from agricultural uses and a few lightly travelled roads in the immediate vicinity of Melrose AFR and the land gift area.

The 2011 *Cannon Air Force Base and Melrose Air Force Range Joint Land Use Study* provides recommendations to reduce potential conflicts between Cannon AFB, Melrose AFR, and the surrounding region. The goals of the Joint Land Use Study are to accommodate growth, sustain the economic health of the region, and protect public health and safety while minimizing land use conflicts between Cannon AFB, Melrose AFR, and the surrounding communities. No zoning ordinances in Roosevelt and Curry counties directly regulate development in the vicinity of Melrose AFR (Curry County NM 2011).

### **3.7.3 Environmental Consequences**

The significance of land use impacts is based on the level of land use sensitivity in areas affected by a proposed action and the compatibility of a proposed action with existing conditions. A proposed action could have a significant impact with respect to land use if any the following were to occur:

- Be inconsistent or in noncompliance with existing land use plans or policies.
- Preclude the viability of existing land use.
- Preclude continued use or occupation of an area.
- Be incompatible with adjacent land use to the extent that public health or safety is threatened.
- Conflict with planning criteria established to ensure the safety and protection of human life and property.
- Create adverse visual intrusions or visual contrasts affecting the quality of a landscape.

### 3.7.3.1 PROPOSED ACTION

#### 3.7.3.1.1 *Demolition and Construction and Utilities and Fencing*

Short-term, negligible, adverse impacts on land use would occur during the proposed demolition and construction activities associated with all projects listed in **Tables 2-1** and **2-2** and all proposed construction activities associated with the utilities and fencing projects listed in **Table 2-4**. Adverse impacts on land use would result because demolition and construction activities would generate nuisance noises, dust, and higher levels of traffic in the vicinity of demolition and construction sites; however, these impacts would be temporary in nature, occur during regular business hours, and would not place significant burdens on nearby land uses due to the primarily rural and agricultural nature of the region.

Long-term, minor, beneficial impacts on land use would occur from the operation of the facilities proposed on the Operational Training Area and Hazard Area of Melrose AFR. (The operation of the facilities proposed on the land gift area of Melrose AFR is discussed in the Land Gift Area subsection.) The proposed facilities are grouped into eight zones, and Zones 1, 2, 6, and 7 would be sited within the Operational Training Area and Hazard Area. Many of these facilities are not new to Melrose AFR but are the relocation of existing facilities to locations that allow for full utilization of the range. Each zone would be sited in a location that considers the applicable land use constraints to ensure that facilities do not interfere with current and future operations or introduce new noise or safety hazards. For example, Zone 1, the Range Support Complex, would be sited on the Operational Training Area, while Zone 3, Mortar Pits, would be sited on the Hazard Area. Additionally, appropriate changes to or establishment of AICUZ noise zones, APZs, CZs, and ESQD arcs would occur, as necessary for each facility, and each facility would be sited to accommodate these changes. The siting of each facility would be consistent with the Comprehensive Range Plan. The various facilities within each zone are grouped together based on similarity, and therefore, the operation of each facility would not adversely affect others in the same zone.

#### 3.7.3.1.2 *Land Gift Area*

Long-term, moderate, adverse impacts on land use would occur from the administrative action of non-renewal of the land gift area leases. Available acreage for ranching in the region would decrease by 10,968 acres by not renewing the leases. Some areas have been ranched for multiple generations and non-renewal of these leases would result in the loss of this area for ranching. However, impacts would not be significant due to the abundance of available agricultural land in the region.

Long-term, minor, adverse and beneficial impacts on land use would occur from the operation of the training facilities proposed on the land gift area of Melrose AFR. Zones 4, 5, and 8 are within the land gift area. Zone 4 (DLQ pad) and Zone 8 (HLZs) are facilities that would relocate from the center of Melrose AFR to the perimeter of the installation. Zone 5 (Off-Road Driving Course) is a new facility to Melrose AFR. The operation of these facilities would create new sources for noise and dust from the use of helicopters, aircraft, and off-road vehicles. Noise and dust could travel onto the surrounding ranch land due to the proximity of these facilities to the western boundary of the installation. However, impacts would be less than significant due to the primarily rural and agricultural nature of the surrounding region and the lack of receptors. Additionally, appropriate changes to or establishment of AICUZ noise zones, APZs, and CZs

would occur from Zones 4 and 8, and each facility would be sited to accommodate these changes. The siting of each facility would be consistent with the Comprehensive Range Plan.

#### **3.7.3.1.3 Western Target Area**

Long-term, minor, beneficial impacts on land use would result from the reintroduction of air- and ground-to-ground direct fire explosive munitions training in the western target area. The reintroduction of explosive munitions training to the western target area would support efficient training on the range by centralizing multiple SDZs and WDZs so simultaneous training activities could occur without disrupting other operations on the range. This is consistent with the Comprehensive Range Plan. The western target area is within the impact area of Melrose AFR, where explosive munitions training is currently occurring. Explosive munitions training on western target area would be consistent with nearby land uses because it is located between the Jockey and Spirit impact areas for direct fire explosive munitions training. Appropriate changes to the ESQD arcs would occur, as necessary.

#### **3.7.3.1.4 Munitions Expenditures**

No impacts on land use would result from the proposed changes in munitions expenditures. No changes to the locations or sizes of ESQD arcs would occur from the changes in munitions expenditures.

### **3.7.3.2 ALTERNATIVE 1**

The impacts on land use from Alternative 1 would be similar to those described under the Proposed Action. The only appreciable difference from the Proposed Action is fewer impacts on adjacent land uses would occur from operating the proposed DLQ pad (e.g., Zone 4) on the Operational Training Area rather than near the installation boundary on the land gift area. Moving the proposed location for the DLQ pad away from the installation boundary would limit the potential for noise and dust to travel onto the surrounding ranch land to the west of the land gift area.

### **3.7.3.3 ALTERNATIVE 2**

The impacts on land use from Alternative 2 would be similar to those described under the Proposed Action. The only appreciable difference from the Proposed Action is the impacts from the reintroduction of air- and ground-to-ground direct fire explosive munitions training on the western target area would not occur. The western target area would continue to be used for non-explosive training and no impacts on land use would occur.

### **3.7.3.4 NO ACTION ALTERNATIVE**

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Land use conditions would remain the same as existing conditions as described in **Section 3.7.2**. Local ranchers would continue to ranch the same acreage on the land gift area and the western target area would continue to be used for non-explosive training. Therefore, no impacts on land use would be expected to occur.



## 3.8 Hazardous Materials and Wastes

### 3.8.1 Definition of the Resource

The terms “hazardous materials” and “hazardous waste” refer to substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA). In general, “hazardous materials” refers to any item or agent (biological, chemical, or physical) that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. A complete list of federally recognized hazardous substances as well as their reportable quantities is provided in 40 CFR Part 302.4. Many substances not on this list may be considered hazardous according to their ignitability, corrosivity, reactivity, or toxicity as defined by 40 CFR Part 261.20–24.

Hazardous wastes that are regulated under RCRA are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that either exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, reactivity, or are listed as a hazardous waste under 40 CFR Part 261. The Environmental Restoration Program is a USAF program to identify, characterize, and remediate environmental contamination from past activities at USAF installations.

Metals found in munitions, such as lead, antimony, copper, and zinc, generally tend to adhere to soil grains and organic material and remain fixed in shallow soils. These metals can migrate off a range and into surface water through erosion and surface runoff. The use and handling of expended ordnance is regulated under the Military Munitions Rule, which excludes ranges used for training and the testing of munitions constituents, as well as range clearance as part of range management activities from the application of RCRA or CERCLA. The USEPA amended RCRA in 40 CFR Parts 260–266 and 270 Subpart M in 1997 to further define requirements for the management, transportation, storage, and disposal of munitions, munitions wastes, and related materials. AFI 36-2226, *Combat Arms Programs*, regulates small arms munitions; AFI 23-101, *Materiel Management*, regulates transport, storage, and handling of munitions and explosives; and AFI 13-212, details with management and use of munitions and explosive on range lands.

Issues associated with hazardous material and waste typically center around waste streams; USTs; aboveground storage tanks (ASTs); and the storage, transport, use, and disposal of pesticides, fuels, lubricants, and other industrial substances. When such materials are used or not disposed of properly, they can threaten the health and well-being of wildlife species, habitats, soil and water systems, and humans.

### 3.8.2 Affected Environment

Melrose AFR is operated under a contract with personnel who monitor and maintain the televised ordnance scoring system, targets, access roads, and firebreaks. Small quantities of hazardous materials such as paints are used at the range and are managed through the Cannon AFB Hazardous Materials Management Program (Cannon AFB 2010).

Melrose AFR qualifies as a conditionally exempt, small-quantity generator due to monthly waste generation. Generation of RCRA hazardous and universal waste may include containers of

liquid or solid accumulations for processes used to clean parts and equipment, and battery replacements (Cannon AFB 2010).

Range management at Melrose AFR includes removal of metal fragments from inert, live, and high explosive ordnance, targets, and training ammunition. Under current practice, munitions are safely recovered and removed from the targets and are stored in the holding container designation area. Current practices are necessary for compliance with AFI 13-212, which requires the clearance of range munitions debris on a regular basis. Tactical and conventional targets are cleared every 75 days of use to a radius of 328 feet (100 meters) and annually to a radius of 984 feet (300 meters) (Cannon AFB 2010).

The Cannon AFB EOD team inspects all munitions debris. Solid waste (i.e., scrap munitions), including inert (nonexplosive) ordnance, is currently stored in several locations within the target impact area at Melrose AFR. Munitions debris is subjected to double inspection by EOD or a mechanized process to ensure ammunition, explosives, and other dangerous articles are not released to the public, in accordance with the Defense Reutilization and Marketing Office directives as directed by a Memorandum of Agreement with Defense Reutilization and Marketing Office or through an option for direct commercial sales (27 SOW 2011, USAF 2007a). Defensive chaff and flares are used as part of current operations over Melrose AFR. Residual chaff and flares do not release chemicals in potentially dangerous concentrations under conditions found at Melrose AFR (USAF 2007a).

There are currently five ASTs located on Melrose AFR that are reported to contain gasoline or diesel fuel. These tanks comply with applicable USAF regulations on spill containment safety. The tanks can be moved to serve new facilities or removed from the range and disposed of as appropriate with minimal cost. There are no USTs on Melrose AFR (Cannon AFB 2010).

Buildings proposed for demolition include the fire station, which is over 40 years old and may contain lead-based paint and asbestos-containing materials. The date of the administrative facility is unknown, and therefore it is assumed it may also contain lead-based paint and asbestos-containing materials.

As part of an ongoing examination of past waste management practices at Melrose AFR, Cannon AFB has identified three Solid Waste Management Units and seven Areas of Concern associated with past military activities, maintenance, and disposal activities. In 2007, NMED granted an indefinite work plan status for these sites, requiring no remedial action until the range is closed. An operational range assessment was conducted in 2007, and no chemicals of concern related to munitions were found to be migrating from the range. Long-term monitoring of the sites began in 2009 and a baseline study was conducted to include analysis of munitions-related chemicals of concern. There are currently no special regulatory land use restrictions on the seven sites. All unexploded ordnance on the surface has been removed and disposed of from all sites, but several sites may still contain subsurface UXO (USAF 2007a).

### **3.8.3 Environmental Consequences**

#### **3.8.3.1 PROPOSED ACTION**

Short-term and long-term, minor to negligible, adverse impacts would result from the implementation of the Proposed Action. Implementation of the Proposed Action is not

anticipated to result in significant impacts from the use of hazardous materials or generation of hazardous wastes. Hazardous materials used during proposed activities would include munitions constituents, pesticides, gasoline, diesel fuel, and other petroleum, oils, and lubricants typical in maintaining and operating vehicles and equipment. The use of these materials is not anticipated to result in a significant increase in the amount of hazardous wastes currently generated at Melrose AFR. All hazardous materials and wastes must be handled, stored, transported, and disposed of in accordance with applicable installation policies, USAF regulations, and local, state, and Federal laws. There is a potential for incidental spills of hazardous materials and petroleum products associated with construction, demolition, and training activities. In the event of a spill of hazardous materials or petroleum products, Cannon AFB would implement appropriate containment and cleanup in accordance with established spill plans and applicable laws and regulations. No significant impacts are expected to result from the use, storage, or disposal of hazardous materials or wastes associated with the Proposed Action.

#### **3.8.3.1.1 Demolition and Construction**

Short-term, negligible, adverse impacts would be expected from proposed demolition, construction, and renovation activities. These activities may require the use of hazardous materials by contractors and USAF personnel. Cannon AFB would maintain any hazardous materials and no adverse environmental impacts are anticipated. Project contractors would comply with all Federal, state, and local environmental laws.

Hazardous wastes may be generated during demolition, construction, and renovation activities; these wastes may include excess paint, adhesives, lubricants, fuels, and debris containing lead-based paint or asbestos-containing materials. Storage and disposal of these wastes would be the responsibility of the site contractor and Cannon AFB's Hazardous Waste Program. Any hazardous waste generated by USAF personnel and employees during the proposed activities would be handled by Cannon AFB Hazardous Waste Managers in accordance with the Cannon AFB Hazardous Waste Management Plan. The Proposed Action is not expected to result in significant adverse impacts as a result of hazardous materials and waste use, generation, or management associated with construction or demolition activities.

#### **3.8.3.1.2 Utilities and Fencing**

Short-term, negligible, adverse impacts would be expected from proposed utilities and fencing construction activities. Cannon AFB and its contractors would properly use and maintain any hazardous materials during construction, and no significant adverse environmental impacts are anticipated. Project contractors would comply with all Federal, state, and local environmental laws.

Hazardous wastes, including paints, adhesives, lubricants, and fuels may be generated during utilities and fencing activities. Storage and disposal of wastes would be the responsibility of the site contractor and Cannon AFB's Hazardous Waste Program. Hazardous waste generated by USAF personnel and contractors during the proposed activities would be handled in accordance with the Cannon AFB Hazardous Waste Management Plan. The Proposed Action is not expected to result in significant adverse impacts as a result of hazardous materials and waste use, generation, or management associated with installation of utilities and fencing, or the removal of existing fencing.

#### **3.8.3.1.3 Land Gift Area**

Short-term, negligible, adverse impacts would be expected from proposed construction activities in the land gift area. Construction or leveling of DZs and HLZs, the DLQ pad, and road maintenance in the land gift area may require the use and maintenance of hazardous materials by contractors and USAF personnel in accordance with all Federal, state, and local environmental laws.

Hazardous wastes, including paints, adhesives, lubricants, and fuels may be generated during site activities within the land gift area. Storage and disposal of wastes would be the responsibility of the site contractor and Cannon AFB's Hazardous Waste Program. Any hazardous waste generated by USAF personnel and contractors during construction or operations would be handled in accordance with the Cannon AFB Hazardous Waste Management Plan.

#### **3.8.3.1.4 Western Target Area**

Impacts would be similar to those discussed in **Section 3.8.1.1.2**. Implementing BMPs to control the accumulation of spent ammunition, stormwater runoff, and soil erosion would reduce the potential for impacts resulting from metals migrating off the active ranges via soil erosion, stormwater runoff, and vehicular transport.

#### **3.8.3.1.5 Munitions Expenditures**

Long-term, negligible, adverse impacts could be expected from implementation of the Proposed Action. Reconfiguration of Melrose AFR under the Proposed Action would change training capabilities and effectiveness; therefore, an associated increase or decrease in munitions expenditures is projected. Projected changes in munitions expenditures accounts for all explosive and non-explosive munitions training that would occur on Melrose AFR under the Proposed Action.

Changes in munitions expenditures under the Proposed Action are not anticipated to result in an increase of NEW beyond levels currently expended on Melrose AFR. The Proposed Action is not expected to result in significant adverse impacts as a result of hazardous materials and waste use, generation, or management associated with changes in munitions expenditures.

Implementing BMPs to control the accumulation of spent ammunition, stormwater runoff, and soil erosion would reduce the potential for impacts resulting from metals migrating off the active ranges via soil erosion, stormwater runoff, and vehicular transport.

#### **3.8.3.2 ALTERNATIVE 1**

The alternate range configuration would have the same range components as the Proposed Action. The impacts associated with the Proposed Action would also be expected for Alternative 1. This alternative would implement all projects described under the Proposed Action; however, some projects would be located in alternative locations or would be configured differently. There would be no net difference in use or generation of or impacts from hazardous materials and hazardous wastes between this alternative and the Proposed Action.

### 3.8.3.3 ALTERNATIVE 2

Under this alternative, the USAF would implement all of the actions under the Proposed Action, with the exception of reintroducing explosive munitions to the western target area. Alternative 2 would be very similar to the Proposed Action, and its associated impacts would also be similar but less. The main difference would be that hazardous materials and hazardous wastes would not be generated from the use and management of explosive munitions.

### 3.8.3.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. No changes in the use, storage, or disposal of hazardous materials and waste would occur. Use and generation of hazardous materials and wastes would continue to be managed in accordance with current management policies, procedures, and applicable laws and regulations. Therefore, no new impacts on hazardous materials and waste management would be expected to occur.

## 3.9 Health and Safety

### 3.9.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses the safety of demolition and construction contractors and USAF personnel during the various aspects of the Proposed Action and alternatives.

Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Hazardous activities can include transportation, rural training exercises, and the creation of extremely noisy environments. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

### 3.9.2 Affected Environment

**Contractor Safety.** All contractors performing demolition and construction activities at Melrose AFR are responsible for following ground safety regulations and workers compensation programs and are required to avoid risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment (PPE), and availability of Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractors should review potentially hazardous workplace operations; monitor exposure to workplace chemicals (e.g., asbestos, lead, and hazardous materials), physical hazards (e.g., noise propagation and falls), and biological agents (e.g., infectious waste, wildlife, and poisonous plants); recommend and evaluate controls (e.g., prevention, administrative, and engineering) to ensure personnel are properly protected or unexposed; and ensure a medical surveillance program to perform occupational health physicals for workers subject to accidental chemical exposures.



**USAF Personnel Safety.** AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, implements AFD 91-3, *Occupational Safety and Health*, by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with the USAF Mishap Prevention Program, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities.

AFI 13-212 outlines the management procedures for ranges at USAF installations. In addition to other objectives, this instruction provides guidance on how to operate ranges safely. Melrose AFR follows AFI 13-212 at the two active impact areas for direct fire explosive munitions training.

### 3.9.3 Environmental Consequences

Any increase in safety risks is considered an adverse impact on safety. Significant impacts on health and safety would be expected if the Proposed Action does either of the following:

- Substantially increases risks associated with the safety of contractors, USAF personnel, or the local community
- Introduces a new health or safety risk for which the USAF is not prepared or does not have adequate management and response plans in place.

#### 3.9.3.1 PROPOSED ACTION

##### 3.9.3.1.1 Demolition and Construction and Utilities and Fencing

Short-term, minor, adverse impacts on health and safety would occur during the proposed demolition and construction activities associated with the projects listed in **Tables 2-1** and **2-2** and the proposed construction activities associated with the utilities and fencing projects listed in **Table 2-4**. Adverse impacts would result from the exposure of demolition and construction workers to the safety hazards associated with such activities. Examples of such safety hazards include slips/trips/falls; exposure to the heat, cold, and wet conditions; and fire, mechanical, electrical, vision, noise, chemical, and respiratory hazards.

During all phases of demolition and construction, safety standards required by the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health would be followed. Workers would be required to wear PPE such as ear protection, steel-toed boots, hard hats, gloves, and other appropriate safety gear. Demolition and construction areas would be fenced and appropriately marked with signs and placards. Equipment and associated trucks transporting material to and from the demolition and construction site would be directed to roads and streets that can safely accommodate these vehicles.

##### 3.9.3.1.2 Land Gift Area

No impacts on health and safety would occur from the administrative action of not renewing the land gift area leases. No inherently unsafe activities would be removed from the land gift area when the private ranchers and ranching companies withdraw from the area.

Long-term, negligible, adverse impacts on health and safety would occur from the proposed military training on the land gift area. Most training proposed on the land gift area would not be

new training to Melrose AFR but rather training that has relocated from within the center of Melrose AFR to the land gift area. Examples of relocated training include the use of HLZs, a DLQ pad, and a DZ. As a result, no new health and safety risks would be produced from the use of these features on the land gift area. The only training proposed on the land gift area that would be new to Melrose AFR is the use of an off-road driving course. USAF personnel would be exposed to a slightly elevated health and safety risk potential while driving the various vehicles (e.g., Humvees, all-terrain vehicles, motorcycles, MRAPs) on the course. The primary risk potential would result from vehicle collisions and rollovers. The potential for vehicular accidents would be reduced because all drivers would be instructed on safe operating techniques prior to using the course. Drivers and passengers would wear proper PPE (e.g., helmets) while on the course.

#### **3.9.3.1.3 Western Target Area**

Long-term, negligible, adverse impacts on health and safety would occur from the reintroduction of air- and ground-to-ground direct fire explosive munitions training on the western target area. While the reintroduction of explosive munitions training on the western target area would not change existing munition expenditures at Melrose AFR, it would increase the size of the area on the installation where explosive munitions training occurs and consequently would increase the proportion of the installation where personnel could be exposed to UXO and safety hazards associated with explosive munitions training. Explosive munitions safety hazards on the western target area would be managed in accordance with the management procedures currently conducted at the other explosive munitions training ranges on the installation, namely AFI 13-212. USAF personnel would perform appropriate range management practices (e.g., install warning signs, restrict access, conduct annual clearance of UXO from the surface of impact areas, etc.) on the western target area in accordance with AFI 13-212.

#### **3.9.3.1.4 Munitions Expenditures**

Long-term, negligible, beneficial impacts on health and safety would occur from the proposed change in munitions expenditures on the installation. Under the Proposed Action, there would be a slight reduction (i.e., 2,584 pounds) in NEW from levels currently expended on Melrose AFR. This slight reduction in NEW would negligibly decrease the potential for USAF personnel to be exposed to explosive safety hazards during munitions training.

#### **3.9.3.2 ALTERNATIVE 1**

The impacts on health and safety from Alternative 1 would be identical to those described under the Proposed Action. Identical health and safety risks would be produced from the various alternative range configurations as the Proposed Action.

#### **3.9.3.3 ALTERNATIVE 2**

The impacts on health and safety from Alternative 2 would be similar but less than those discussed under the Proposed Action. The only appreciable difference from the Proposed Action is that the adverse impacts from the reintroduction of air- and ground-to-ground direct fire explosive munitions training on the western target area would not occur. The proportion of the installation where personnel could be exposed to UXO and safety hazards associated with explosive munitions training would remain the same as existing conditions.

#### 3.9.3.4 NO ACTION ALTERNATIVE

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. No new health and safety risk factors would be introduced from the No Action Alternative. Therefore, no new impacts on health and safety would be expected to occur.

### 3.10 Socioeconomics and Environmental Justice

#### 3.10.1 Definition of the Resource

**Socioeconomics.** Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Demographics, employment characteristics, and housing occupancy status data provide key insights into socioeconomic conditions that might be affected by a proposed action.

**Environmental Justice.** EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. EO 12898 was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether or not a proposed action would render vulnerable any of the groups targeted for protection in the EO.

**Protection of Children from Environmental Health and Safety Risks.** EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, states that each Federal agency "(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and (b) shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

#### 3.10.2 Affected Environment

For the purpose of this socioeconomic analysis, three different spatial levels are used: (1) the ROI, defined as Curry and Roosevelt counties surrounding both Cannon AFB and Melrose AFR; (2) the State of New Mexico; and (3) the United States.

The ROI best illustrates the socioeconomic characteristics for the areas adjacent to the installation and the geographic areas where most impacts from the Proposed Action would occur. Curry and Roosevelt counties represent the areas that would be directly affected by the Proposed Action; therefore they are included in the analysis. Data for the State of New Mexico

provide baseline comparisons for the ROI. Data for the United States are included to provide an additional baseline level for comparison.

**Demographics.** U.S. Census population data from 2000 and 2010 were used to analyze the spatial levels presented in **Table 3-16**. Three-year population estimates from 2011 to 2013 were used as a more current estimate of the most recent conditions for comparison purposes. Population growth within the ROI has grown considerably from 2000 to 2013, though at a slower rate than the State of New Mexico. New Mexico has seen the greatest percentage of change in population across all spatial levels, comparatively.

**Table 3-16. Population Data for Spatial Levels in 2000, 2010, and 2013**

Location	2000	2010	2013*	Percent Change 2000 to 2010	Percent Change 2000 to 2013*
Curry County	45,044	47,005	50,328	4.3	11.7
Roosevelt County	18,018	19,439	20,239	7.9	12.3
<b>ROI Summary</b>	<b>63,063</b>	<b>66,444</b>	<b>70,567</b>	<b>5.4</b>	<b>11.9</b>
New Mexico	1,819,046	2,037,799	2,082,250	12	14.5
United States	281,421,906	306,738,433	313,861,723	9	11.5

Sources: USCB 2000, USCB 2010, USCB 2013

\*Note: 2013 data represent 3-year estimates from 2011 to 2013 and are intended to provide a more precise estimate of current conditions across all spatial levels.

Housing data for the ROI, New Mexico, and the United States is presented in **Table 3-17**. U.S. Census Bureau (USCB) data indicate there is a total of 28,596 housing units in the ROI, with approximately 11.1 percent of them vacant. New Mexico has the highest percent vacant at 15.9 percent. The ROI has a lower percentage of vacant housing units (11.1 percent) than the United States at 12.6 percent vacant.

**Table 3-17. Vacant Housing Units in the ROI, New Mexico, and the United States (2011–2013)**

Location	Total Units	Vacant Units	Percent Vacant
Curry County	20,356	2,115	10.4
Roosevelt County	8,240	1,059	12.9
<b>ROI Summary</b>	<b>28,596</b>	<b>3,174</b>	<b>11.1</b>
New Mexico	904,189	143,938	15.9
United States	132,393,354	16,662,050	12.6

Sources: USCB 2013

Note: Numbers present in this table are based on estimates from the American Community Surveys.

**Employment Characteristics.** The total estimated civilian employed population within the ROI was 29,413 people. As of 2013, approximately 3.5 percent of the workforce was employed by the Armed Services, which is significantly higher than that of New Mexico and the United States which is 0.5 and 0.4 percent, respectively. The education, health, and social services field comprises the largest percentage of the workforce across all spatial levels. **Table 3-18** displays employment characteristics for the ROI, New Mexico, and the United States (USCB 2013).

**Table 3-18. Employment Characteristics by Industry for 2010 to 2013**

Industry	Curry County	Roosevelt County	ROI Summary	New Mexico	United States
Percent of civilian population 16 years old and over in the labor force	60.6	61.5	<b>60.9</b>	59.7	63.4
Percentage of employed persons in the Armed Forces	4.7	0.8	<b>3.5</b>	0.5	0.4
Agriculture, forestry, fishing, and hunting and mining	7.1	8.1	<b>7.4</b>	4.5	2.0
Construction	7.2	6.9	<b>7.1</b>	6.8	6.1
Manufacturing	3.8	3.1	<b>3.6</b>	5.1	10.5
Wholesale trade	2.9	3.8	<b>3.1</b>	2.1	2.7
Retail trade	9.8	13.4	<b>10.9</b>	11.2	11.6
Transportation and warehousing, and utilities	10.1	5.3	<b>8.7</b>	4.5	4.9
Information	1.1	0.6	<b>0.9</b>	1.6	2.1
Finance, insurance, real estate, and rental and leasing	3.6	2.6	<b>3.3</b>	4.5	6.6
Professional, scientific, management, administrative, and waste management services	6.5	5.4	<b>6.2</b>	11.0	10.9
Education, health, and social services	23.6	29.3	<b>25.3</b>	25.0	23.2
Arts, entertainment and recreation	8.7	11.1	<b>9.4</b>	11.0	9.5
Other services (except public administration)	4.7	5.3	<b>4.9</b>	4.9	5.0
Public administration	11.0	5.1	<b>9.2</b>	8.0	4.9

Source: USCB 2013

Annual unemployment rates for the ROI have been consistently below both the state and national unemployment rates (see **Figure 3-5**). All spatial levels saw a decrease in unemployment rates from 2005 to 2007, with a steep increase associated with the economic recession starting in 2008 and peaking in 2010. Unemployment rates have not yet returned to pre-recession levels. Unemployment rates for Curry and Roosevelt counties were 4.1 and 3.9 percent in 2005, respectively, and, as of 2014, stand at 4.9 and 5.5 percent, respectively, which are below state and nationwide levels. The New Mexico unemployment rate in 2014 stood at 6.5 percent, slightly above that of the United States at 6.2 percent (BLS 2015).

**Environmental Justice and Protection of Children.** White populations are relatively similar across all spatial levels of analysis. Roosevelt County and New Mexico (2.3 and 2.1 percent, respectively) both have much lower black or African-American populations than the ROI and the United States (see **Table 3-19**). The ROI and New Mexico both have lower Asian populations than the national data as well. Hispanic or Latino populations are significantly higher in the ROI and New Mexico (39.7 and 47 percent, respectively) than the national data (USCB 2013).



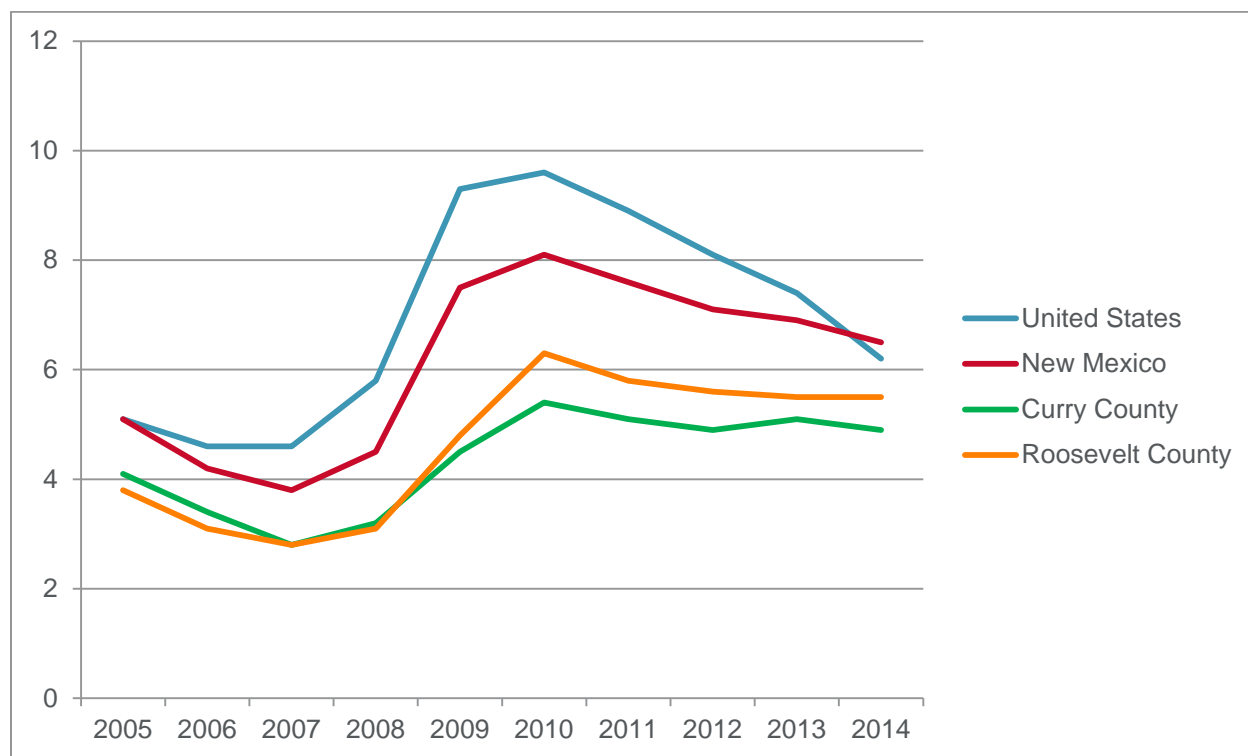


Figure 3-5. Unemployment Data among Socioeconomic Spatial Levels

Table 3-19. Race, Ethnicity, and Poverty Characteristics in the United States, New Mexico, and Curry and Roosevelt County, New Mexico, for 2011 to 2013

Race and Origin	Curry County	Roosevelt County	ROI Summary	New Mexico	United States
Total Population	50,328	20,239	<b>70,567</b>	2,082,250	313,861,723
Percent Under 18 Years of Age	27.4	25.5	<b>28.9</b>	24.6	23.5
Percent Over 65 Years of Age	11.1	11.8	<b>11.3</b>	14.1	13.7
Percent White	71.6	72.2	<b>71.7</b>	72.9	73.9
Percent Black or African American	6.6	2.3	<b>5.3</b>	2.1	12.6
Percent American Indian and Alaska Native	1.1	1.5	<b>1.2</b>	9.1	0.8
Percent Asian	1.3	0.6	<b>1.1</b>	1.3	5.0
Percent Native Hawaiian and Other Pacific Islander	0.0	0.1	<b>0.0</b>	0.1	0.2
Percent Other Race	15.8	22.1	<b>17.6</b>	11.3	4.7
Percent Two or More Races	3.6	1.3	<b>2.9</b>	3.2	2.9
Percent Hispanic* or Latino	39.6	40.0	<b>39.7</b>	47.0	16.9
Median Household Income	\$40,125	\$34,529	<b>N/A</b>	\$53,555	\$52,176
Percent of Families Living Below Poverty	16.6	23.1	<b>19.9</b>	16.6	11.7

Source: USCB 2013

Key: \* = percent Hispanic of any race.

Note: No median household income is available for the ROI.

The median household income for Curry and Roosevelt counties is well below both the New Mexico (\$53,355) and national (\$52,176) medians between 2010 and 2013. Roosevelt County has the lowest median income across all spatial levels at \$38,639. In addition, Roosevelt County also has the greatest number of families below the poverty line at 23.1 percent. Approximately 19.9 percent of families live below the poverty line in the ROI, with 16.6 and 11.7 percent living below the poverty line in New Mexico and the United States, respectively.

The percentage of children representing the total population (i.e., individuals under 18 years of age) living within the ROI is higher than any other population at 28.9 percent and higher than New Mexico (24.6) and the United States (23.5). Apart from scattered residences nearby, the nearest housing areas with populations of children are in Melrose, New Mexico, approximately 8 miles northeast of the Proposed Action.

### 3.10.3 Environmental Consequences

**Socioeconomics.** The significance of socioeconomic effects is assessed in terms of direct and indirect effects on the local economy and related effects on other socioeconomic resources (e.g., income, housing, and employment). The magnitude of potential effects can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area, but could have significant effects in a rural community.

**Environmental Justice.** Ethnicity and poverty data are examined for the local area and compared to appropriate statistics to determine if a low-income or minority population could be disproportionately affected by the Proposed Action. This section also evaluates effects from the Proposed Action on children's environmental health and safety risks.

#### 3.10.3.1 PROPOSED ACTION

##### 3.10.3.1.1 *Demolition and Construction*

Short-term, minor, beneficial impacts on socioeconomics would be expected from demolition and construction activities. Impacts from demolition and construction activities under the Proposed Action would stimulate the local economy through increases in payroll taxes, sales receipts, and the indirect purchase of goods and services. Construction workers could come from within the ROI because, as of 2013, approximately 2,093 personnel (7.1 percent) are considered construction workers from within the ROI and would be able to meet demand; otherwise construction workers would be able to come from urban areas in New Mexico and Texas such as Albuquerque. In addition, the demolition and construction activities under the Proposed Action would be staggered, further reducing the demand for construction and demolition workers. Short-term increases in local business volume would be expected to occur due to the purchase of local construction materials, supplies, and other related services. No impacts on housing would be expected as there would be no changes in the number of personnel on Melrose AFR.

No impacts on environmental justice would be expected from demolition and construction activities since all demolition and construction would occur on Melrose AFR. No minority groups would be disproportionately affected because all the work would occur within Melrose AFR boundaries and no children live nearby the Proposed Action areas.

#### **3.10.3.1.2 Utilities and Fencing**

Impacts from the reconfiguration of range support facilities and additional installation of utilities and fencing would be similar to, but slightly less than, those mentioned under **Section**

**3.10.3.1.1**. Though the area of disturbance is larger for utilities and fencing projects, it would be expected that fewer materials and construction personnel would be required. Similarly, construction at Melrose AFR for utilities and fencing would be staggered and, therefore, the existing local workforce would sufficiently meet the workforce demands.

#### **3.10.3.1.3 Land Gift Area**

Construction of the HLZs and DLQ pads would have similar socioeconomic and environmental justice impacts as those mentioned under **Section 3.10.3.1.1**.

Long-term, minor, adverse impacts could result from the four agricultural subleases for the land gift area not being renewed. The land gift area is currently subleased to ranchers or ranching companies, which brings local revenue to the ROI and other local counties. Non-renewal of leases in the land gift area could reduce revenue streams of ranching and ranching activities in the area.

#### **3.10.3.1.4 Western Target Area**

No impacts on socioeconomics or environmental justice would arise from reconfiguration of the western target area and reintroduction of explosive munitions, which would not be expected to impact local populations because there are no local populations within 2 miles of the area. In addition, as described in **Section 3.2.3.1.4**, there would be no appreciable changes in noise outside of the Melrose AFR boundary.

#### **3.10.3.1.5 Munitions Expenditures**

No impacts on socioeconomics or environmental justice would be expected from munitions expenditures because changes in munitions training capabilities and effectiveness would not have impacts on socioeconomics or environmental justice.

### **3.10.3.2 ALTERNATIVE 1**

Impacts on socioeconomics and environmental justice under Alternative 1 would be the same as those mentioned under the Proposed Action because the same projects would be implemented within the same area under Alternative 1, except in a different configuration within Melrose AFR.

### **3.10.3.3 ALTERNATIVE 2**

Impacts on socioeconomics and environmental justice under Alternative 2 would be the same as those discussed under the Proposed Action except the reintroduction of explosive munitions into the western target area would not occur.

### **3.10.3.4 NO ACTION ALTERNATIVE**

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Therefore, no new impacts on socioeconomics and environmental justice would be expected to occur.

## 3.11 Infrastructure and Utilities

### 3.11.1 Definition of Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The components to be discussed in this section include facility infrastructure, utilities, and solid waste management.

### 3.11.2 Affected Environment

**Facility Infrastructure.** There are a variety of structures located within the Melrose AFR, generally separated into two parts, the administrative area and the Electronic Warfare Complex or “the mesa”. Buildings 3121, 3123, 3125, 3160, and 3200 are equipped with a septic tank and leach field (Cannon AFB 2009). Additional structures associated with the mini-MUTES are within fenced enclosures along Sundale Valley Road on Melrose AFR near the entrance gate and along South Krider Road near the electronic gate that accesses South Roosevelt Road (aka Mesa Road). Mini-MUTES are electronic warfare training systems that simulate radar emissions for use in USAF aircrew training. Intermodal containers (i.e., conex boxes) are also used throughout Melrose AFR to replicate gasoline stations, markets, villages, and other facilities for training purposes (Melrose AFR 2013). **Table 3-20** shows the main structures on Melrose AFR.

**Table 3-20. Melrose AFR Facility Infrastructure**

Building Number	Building/Structure Name	Area (square feet)
<b>Administrative Area</b>		
3110	Control Tower	270
3112	North Flank Tower	275
3113	Recreation Pavilion	642
3114	Generator Shed	178
3120	Wind Meter	13
3121	Main Building	5,315
3123	Fire Department	2,199
3132	Camera Site 1	111
3191	Natural Resources Temporary Administrative Trailer	n/a
3200	EOD Facility	1,109
<b>Electronic Warfare Complex (“The Mesa”)</b>		
3125	Mini-MUTES	1,707
3127	Dome	3,413
3160	Main Ground Electronic Combat Control Operations Building	6,136
3161	Interconnect	2,716

Source: Melrose AFR 2013

**Electrical Supply.** The existing electrical system at Melrose AFR consists of overhead and underground three-phase and single-phase distribution lines owned and operated by Roosevelt County Electric Cooperative (RCEC). The power lines are located within a 20-foot-wide easement granted to RCEC. An additional easement allows RCEC power lines to cross a short section of property on Melrose AFR to access a civilian customer. No electrical substations are present on Melrose AFR (Melrose AFR 2013). The distribution lines operate at 12,470 volts line-to-line and 7,200 volts line-to-ground, and are commonly referred to as 12-kilovolt lines. The power lines terminate at transformers at the various facilities that reduce the voltage down to the service level required, with each facility having its own meter. Farmers Electric Cooperative also has a power line immediately north of the range, near North Roosevelt Road. This power line is not located within the range and does not provide power to any range facilities. It is, however, available to provide power to future facilities if economically justifiable (Cannon AFB 2012).

Melrose AFR has a backup generator to supply mission-critical range facilities with electricity in the event of a power outage (Melrose AFR 2013).

**Water Distribution.** The water distribution system facilities within Melrose AFR are used to supply water to the range contractor facility, fire station, EOD warehouse, and two Ground Electronic Combat Control Operations facilities on the mesa. The water distribution system facilities consist of a 25,000-gallon UST, approximately 14,000 LF of 2-inch polyvinyl chloride water lines, a fill stand for supplying tanker trucks, two water production wells (Wells 11 and 13), 13 monitoring wells, and numerous other wells used to partially irrigate leased range fields and for grazing cattle, wildlife management, and fire suppression (Cannon AFB 2012).

Roosevelt and Curry counties have primarily been farmed and grazed since the early 1900s; however, the only remnants of early settlement of the area are a few homesteads. In particular, homesteads, including a main house and associated support structures, are located in the northeastern corner of Melrose AFR adjacent to Well 4, in the northwestern corner of Melrose AFR adjacent to Well 8, and in the southwestern corner of Melrose AFR adjacent to Well 11. An old school house is also located along Krider Road, south of the head of Chapman Draw.

The source of groundwater for the existing wells at Melrose AFR is the Ogallala aquifer. Well 11 is a shallow well capable of producing a flow rate of 11 gpm, while Well 13 is a deep well capable of producing a flow rate of 150 gpm. Well 11 provides water to the 25,000-gallon UST, which is primarily used to support fire suppression activities. Water is pumped by two 5-horsepower pumps from the existing pump house to a fill stand and the range contractor facility. The range contractor facility and UST can be isolated from Well 11 via a valve immediately downstream of the fire station (Cannon AFB 2012).

Although Well 11 is also intended for potable water use, samples indicate the presence of perchlorate above the action level of 24 ppb established by DOD and USAF policy. As a result, Melrose AFR personnel primarily use bottled water for consumption. Recent samples from Well 13 indicate levels of arsenic above maximum contaminant levels, limiting this source to non-potable applications. As a result, Well 13 is only used to supply non-potable water for firefighting at Melrose AFR facilities (Cannon AFB 2012).



Grazing-related surface water features on Melrose AFR include 10 wildlife watering impoundments, 23 steel-rimmed stock tanks, and five other man-made impoundments used to support livestock operations. The steel-rimmed stock tanks average 19 feet in diameter and 18 inches in depth. The other impoundments are less than 0.01 acre each and average approximately 8 feet in depth. Also found within the restricted leased and unrestricted leased areas are groundwater supply wells that service irrigation systems or stock tanks (Melrose AFR 2013).

**Sewer System.** Due to the considerable distance between facilities, a centralized wastewater collection system or treatment system does not exist at Melrose AFR. The existing sanitary sewer system at Melrose AFR includes portable toilets and six septic tanks. A local contractor services the portable toilets and septic tanks, and the wastes are transported by the contractor to an off-installation disposal site. Due to the remote locations served by portable toilets, sporadic usage, relatively low daily loading, and the temporary, mobile nature of the facilities being served, septic tanks are the most practical application of a sewer system on the installation. It is not feasible to provide more robust septic systems (Cannon AFB 2012).

**Fuel Supply.** There are currently six ASTs on Melrose AFR that house either diesel fuel or gasoline (see **Table 3-21**). Five of the six ASTs are relocatable, while the sixth AST is built into the base of the generator that supplies back-up power to the administrative area buildings. These ASTs comply with applicable USAF regulations on spill containment safety. There are no fuel USTs on the installation (Cannon AFB 2009).

**Table 3-21. Fuel-Containing ASTs at Melrose AFR**

Storage Tank Type	Capacity (gallons)	Fuel Type Stored
AST, double-walled	1,000	Gasoline
AST, double-walled	2,000	Diesel
AST, double-walled	1,000	Diesel
AST, single-walled	500	Diesel
AST, single-walled	500	Diesel
AST*, single-walled	70	Diesel

Source: Melrose AFR 2013

\*non-relocatable

Melrose AFR does not use natural gas; however, propane is used for heating and cooking and is stored in gas cylinders in the administrative areas and at the mesa (Melrose AFR 2013).

**Stormwater Drainage.** Melrose AFR does not have a system for controlling stormwater, nor are large stormwater management facilities currently required because there are no large permanent paved areas or buildings that generate sizeable amounts of stormwater runoff. The minimal amount of runoff generated from the existing buildings and paved areas is handled via sheet flow directed away from the infrastructure and toward the desert terrain, where it percolates into the soil or evaporates. The installation has implemented a goal of providing low-impact development (LID) for the surfaced runway, taxiways, parking areas, and buildings such as hangars (Cannon AFB 2012).

**Communications.** Cannon AFB's communications infrastructure comprises telephone service, a local area network, voice radio systems, airfield systems, weather systems, and other supporting systems. The Melrose AFR telecommunications system is tied to Cannon AFB via a microwave system, which provides communication services and connects to the Melrose AFR communications equipment head-end. Telecommunication services are fed from an existing head-end out to support buildings (Cannon AFB 2012).

There are several types of communications infrastructure that support the transmission and distribution of information (e.g., voice, data, or video) throughout Melrose AFR. These include microwave, copper wire, optical fiber, and coaxial cables as well as radio frequency antennas. Microwave communication supports connectivity to the main facilities. Smaller mission-support facilities are connected to the main facilities primarily via copper cable (Cannon AFB 2012).

**Transportation.** The approximately 60,000-acre range is accessible through three gates. The main gate is on Sundale Valley Road on the eastern side of Melrose AFR. The other two gates are along Krider Road in the northwestern and southwestern corners (Cannon AFB 2012).

The roadway system within and around Melrose AFR includes paved highways and paved arterials. New Mexico State Highway 60/84 (NM 60/84) travels east and west along the northern section of Melrose AFR. Krider Road travels north and south from NM 60/84 along the western side of the range and provides a connection to the northwest corner gate. Mesa Road is in the southern section of Melrose AFR and sometimes runs along the southern boundary. Sundale Valley Road parallels NM 60/84 leading to the entrance gate near the center of the eastern boundary of Melrose AFR.

Within the range, the existing roadway system includes a limited amount of paved roads to existing training and administrative facilities, but most of the circulation system consists of unimproved roadways and trails.

**Solid Waste Management.** Less than 220 pounds (100 kilograms) or less of hazardous waste is generated annually making Melrose AFR a Conditionally Exempt Small Quantity Generator of hazardous wastes (Melrose AFR 2013). There are no permitted RCRA solid waste facilities located on Melrose AFR. All generated waste is removed within 90 days by a licensed waste removal company through a DLA Distribution Services contract.

### 3.11.3 Environmental Consequences

#### 3.11.3.1 PROPOSED ACTION

##### 3.11.3.1.1 *Demolition and Construction and Utilities and Fencing*

**Facilities Infrastructure.** Short-term, negligible, adverse impacts on facility infrastructure would occur from demolition and construction activities while operations are relocated. These effects would be temporary and infrastructure requirements post-construction would not differ greatly from activities that currently take place on Melrose AFR. Infrastructure associated with the holding area, target storage, and demolition yard would be abandoned in place.

Long-term, moderate, beneficial impacts on facility infrastructure from construction activities would be expected. Older, inefficient facilities would be replaced with new, more efficient buildings, upgrading facilities, and consolidating functions. In addition, all new construction

would incorporate LID, as appropriate. These actions would promote the minimization of electricity/energy and water consumption and stormwater management techniques to the maximum extent practicable.

**Electrical Supply.** Short-term, negligible, adverse impacts on the electrical supply would occur from a temporary increase in demand for electricity related to construction and demolition activities. Utility lines within the project areas would be relocated and upgraded as necessary. The new SOF PEF and range support facilities and the installation of a new well and water treatment facility and new lighting would require additional power; however, the increase would be accommodated through construction of approximately 6,540 LF of overhead power lines and would not be expected to outstrip capacity of the current electrical supply system. In addition, the consolidation of functions would increase overall installation energy efficiency.

**Water Distribution.** Short- and long-term, minor, adverse and beneficial impacts on the water distribution system at Melrose AFR would occur under the Proposed Action. A temporary increase in demand for water would be related to construction and demolition activities. Approximately 14,350 LF of non-potable water lines and 6,940 LF of potable water lines would be installed underground for fire suppression and personnel use, respectively. These lines would be supplied to the new SOF PEF facility and range support facilities. However, no additional personnel or increase in fire suppression services would be expected. The installation of a new well and water treatment facility would also likely be more efficient than current infrastructure. Therefore, the demand for water would not be expected to increase and the overall training mission would remain relatively unchanged despite the new infrastructure.

**Sewer System.** Short-term, negligible, adverse impacts on the sewer system would be expected from demolition activities. Approximately 2,400 LF of sewer lines and new septic fields would be installed to support sanitation at the SOF PEF and range support facilities. Activities conducted under the Proposed Action would not differ greatly or increase from activities that currently take place on Melrose AFR. Therefore, the installation would continue to accommodate demand on the sewer system.

**Fuel Supply.** Short-term, negligible, adverse effects on the fuel supply would be expected as a result of the minimal amounts of petroleum that would be required during construction and demolition activities. Petroleum would be brought on site by contractors, and remnant amounts would be removed when construction and demolition activities are complete. Potential increases in storage capacity would be minimal. A new generator and tank would be built for the new administration facility to replace the current generator and tank, which would be abandoned in place. All ASTs would be moved and reused, as able. However, if that wouldn't be feasible (e.g., poor tank condition), three double-walled storage tanks would be built for the range control area to support a vehicle fueling station (see **Table 2-2**). No other operations would require the installation of fuel storage tanks, and the demand for fuel would not increase. Therefore, no long-term impacts on the fuel supply would be expected.

**Stormwater Drainage.** Short-term and long-term, minor, adverse impacts on stormwater management would be expected. Soil disturbance associated with construction and demolition activities would disrupt natural stormwater drainage flows and increase soil erosion until the areas are revegetated. There would be a 187,843-ft<sup>2</sup> increase in impervious surfaces and a

132,000-ft<sup>2</sup> increase in permanent unvegetated areas associated with the off-road driving tract, which would increase the rate and volume of stormwater runoff. However, per Section 438 of the Energy Independence and Security Act, Melrose AFR would implement LID, as appropriate, to help mitigate potential increases in stormwater runoff.

**Communications.** Under the Proposed Action, approximately 6,250 LF of underground communications conduit and fiberlink would be installed for the new SOF PEF and range support facilities. Short-term, negligible, adverse impacts would be expected due to the connection and disconnection of communications infrastructure during demolition and construction activities. While these systems would be more modern than current communications systems, the need for communications capacity would not differ greatly from activities that currently take place on Melrose AFR. Therefore, demand on the communications system would remain unchanged, and no long-term impacts would be expected.

**Transportation.** Short-term, negligible, adverse effects on the transportation network would be expected from implementing the selected projects due to increased traffic and parking lot use associated with demolition and construction equipment and contractor vehicles. The construction and demolition activities would require delivery of materials to, and removal of debris from, demolition and construction sites. Construction traffic, however, would be minimal. Many of the heavy construction vehicles would be driven to the site and kept on site for the duration of construction and demolition activities, resulting in relatively few additional trips. Any potential increases in traffic volume associated with the proposed demolition and construction activities would be temporary. Once construction activities were complete, traffic patterns would be expected to return to their pre-construction levels because the number of total installation occupants would not be expected to change.

Long-term, negligible, beneficial impacts on transportation would be expected because parking facilities would be added to the SOF PEF, range operations facility, and the small arms range. Additionally, the road associated with the range operations control facility would be improved resulting in better driving conditions.

**Solid Waste Management.** Increases in solid waste associated with the construction and demolition activities would be temporary, and would be disposed of in accordance with relevant Federal, state, and local regulations. Approximately 1,250 cubic yards of debris would be generated during demolition activities and up to 30,500 cubic yards of solid waste could be created during construction activities (all calculated volumes were rounded up to account for variation in volume estimates). Construction and demolition materials would be recycled or reused to the maximum extent practicable. Debris that could not be recycled or reused would be taken off-installation to an approved construction and demolition landfill within the vicinity of Melrose AFR. Although an increase in impervious surface would occur as a result of the Proposed Action, training activities and personnel would not be increased. Therefore, no long-term impacts on solid waste management would be expected.

#### **3.11.3.1.2 Land Gift Area**

Construction of infrastructure within the land gift area would be minimal. A fence would be erected around the perimeter of the area totaling approximately 83,000 LF. Additionally, a landing pad for V-22 aircraft and a dirt driving track would be constructed within the area.

Lighting would be provided for the V-22 pad. Short-term, negligible, adverse effects on the liquid fuel supply would be expected as a result the minimal amounts of petroleum that would be required during construction activities. A long-term increase in electrical requirements for the lighting would also occur under the Proposed Action; however, these increases would be negligible. No other utilities would be constructed. Any potential increase in solid waste removal would be handled as described for construction and demolition activities.

**3.11.3.1.3 Western Target Area**

No infrastructure would be constructed or demolished in the western target area. No impacts on infrastructure would be expected.

**3.11.3.1.4 Munitions Expenditures**

Under the Proposed Action, the type munitions expenditures would change and ultimately be reduced. This would result in a long-term, negligible, beneficial impact on infrastructure from a slight reduction in munitions cleanup and recycling. No other impacts on infrastructure from munitions expenditures would be expected.

**3.11.3.2 ALTERNATIVE 1**

Under Alternative 1, the off-road driving course, live-fire compound and shoot house, and DLQ pad would be constructed in alternate locations. No utilities would be required for these facilities to be constructed, and impacts on infrastructure from these activities would be similar to those described under the Proposed Action.

**3.11.3.3 ALTERNATIVE 2**

The removal of the western target area from the list of projects under Alternative 2 would have no impact on infrastructure because no additional infrastructure is planned with the western target area under any of the alternatives. Therefore, implementation of Alternative 2 would have the same impacts as the Proposed Action.

**3.11.3.4 NO ACTION ALTERNATIVE**

Under the No Action Alternative, the activities associated with the Proposed Action would not occur. Current infrastructure and utility requirements do not outstrip demand and would remain as described in **Section 3.11.2**. Therefore, no new impacts on infrastructure would be expected to occur.



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## 4. Cumulative Impacts

### 4.1 Cumulative Impacts

CEQ regulations for implementing NEPA require that the cumulative impacts of a proposed action be assessed (40 CFR Parts 1500–1508). A cumulative impact is defined as the following (40 CFR Part 1508.7):

*The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

Cumulative impacts are most likely to arise when a relationship exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with, or in proximity to, a proposed action would be expected to have more potential for a relationship than more geographically separated actions.

The CEQ's guidance for considering cumulative impacts states that NEPA documents "should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant." The first step in assessing cumulative impacts involves identifying and defining the scope of other actions and their interrelationship with a proposed action or alternatives. The scope must consider other projects that coincide with the location and timeline of a proposed action and other actions.

For the purposes of this analysis, the temporal span of consideration is a 5-year period (2015–2020) during which the Proposed Action would occur. This cumulative effects analysis focuses on reasonably foreseeable future projects taking place on and near Melrose AFR, New Mexico.

#### 4.1.1 Projects Considered for Potential Cumulative Effects

**Past Military Actions at Melrose AFR.** As described in detail in **Section 1**, Melrose AFR and Cannon AFB have changed and grown to meet mission needs over the past 60-plus years. Additions to the land, Base Realignment and Closure actions, and overall mission changes have allowed Melrose AFR and Cannon AFB to serve the needs of the SOF and the Combat Air Forces. Past actions and activities are included in this EA under the baseline conditions.

Within the past 5 years, the USAF implemented the non-renewal of grazing leases within the 60,010-acre USAF-owned portion of Melrose AFR. This non-renewal was conducted in 2013 and was based on training activities extending beyond the Melrose AFR impact area and ensured safety parameters for operational training with explosive munitions. The cumulative impact on biological resources of the non-renewal of grazing leases in 2013 and the non-renewal of leases under the Proposed Action would be negligible due to adherence to the Cannon AFB INRMP and Wildland Fire Management Plan. Additionally, socioeconomic impacts would be long term but minor due to the extensive number of acres available for grazing in the region.

**Current and Future Military Actions.** Cannon AFB and other military actions in the region may provide additive or cumulative impacts when combined with the Proposed Action. No additive or cumulative impacts are expected from other military actions outside of Melrose AFR because of the distance between Cannon AFB and Melrose AFR, and the isolation of the range from other installations. Therefore, there are no present or reasonably foreseeable military actions or activities to be included in the cumulative impact analysis.

**Other Federal Actions.** The areas surrounding and adjacent to Melrose AFR include lands that are managed or under the jurisdiction of other Federal agencies including the Bureau of Land Management (BLM), Bureau of Reclamation, USACE, USFWS, FAA, Federal Highway administration, and the Federal Energy Regulatory Commission. Past, ongoing and potential actions and activities taken by these agencies within the ROI or timeframe of the Proposed Action could cause cumulative impacts to resources affected by the Proposed Action.

**Bureau of Land Management.** The BLM Roswell, New Mexico, field office manages BLM lands in Roosevelt and Curry counties. As discussed in **Section 3.7** under Land Use, the areas surrounding the installation are used for livestock grazing, oil and gas and renewable energy development, and recreation. The BLM manages lands in these areas in accordance with their mission and policies, and key issues include fire management, erosion from grazing, and the protection of threatened and endangered species and cultural areas (BLM 1997, BLM 2008, BLM 2013).

Wildfire is a risk within the ROI for the Proposed Action. The BLM provides fire management guidelines which include ecological and resource constraints along with health and safety requirements. The BLM's constraints and requirements for wildfire suppression are based on the intensity of oil field development in the area. Because of the limited oil field development within Roosevelt County, the BLM has determined that the full range of options available for managing wildfire under the appropriate management response would be limited only to health and safety concerns. There are no ecological and resource constraints (BLM 2008).

The BLM does not manage any protection sites for threatened and endangered species or cultural resources within the ROI for the Proposed Action (BLM 2008). Construction and operations at Melrose AFR could impact pass-through areas for wildlife including threatened and endangered species currently being protected. Pre-construction surveys and construction practices discussed in **Section 3.5** under Biological Resources would mitigate potential impacts to those species. Additive impacts to habitat would not be significant.

Soil erosion from the short-term construction activities and the long-term vehicle training activities of the Proposed Action could exacerbate erosion caused by animal grazing within the ROI. As discussed throughout **Section 3**, the use of BMPs for construction activities along with range management and maintenance procedures are expected to mitigate potential erosion to negligible effects. Additive erosion impacts would not be significant.

**Bureau of Reclamation.** The Bureau of Reclamation, through Congress, is providing the funding for a water pipeline that would deliver water from the Ute Reservoir to communities to the south, including Cannon AFB and Melrose AFR. After construction, the project is expected to provide service to these communities until 2060 and after (Reclamation 2011). No

cumulative impacts are anticipated from the water supply project when combined with the Proposed Action.

**United States Fish and Wildlife Service.** The BLM works with the USFWS on the protection of species and habitat on BLM lands. No cumulative impacts above and beyond those from the Proposed Action are anticipated with current and foreseeable future actions by the USFWS.

**Federal Aviation Administration.** The Proposed Action is not expected to impact airspace as discussed in **Section 2**. Therefore, no cumulative impacts are anticipated.

**Federal Highway Administration.** The Proposed action is not expected to impact highways as discussed in **Section 3.11** under Infrastructure and Utilities. Therefore, no cumulative impacts are anticipated.

**Non-Federal Actions.** For this EA, non-Federal actions and activities include those by the State of New Mexico, Curry and Roosevelt counties, state agencies, nearby cities, and private citizens. Past, ongoing, and potential actions and activities taken by these agencies within the ROI or timeframe of the Proposed Action could cause cumulative impacts to resources impacted by the Proposed Action.

Wind energy is an important industry in New Mexico. Development of wind energy projects such as the Roosevelt Wind Project, LLC (operational in 2015) and the Tex-Mex Wind Energy Project (operational in 2016) will be partially located in Roosevelt County. The FAA and Cannon AFB would work with potential developers to ensure there is no potential to affect airspace (Roosevelt County 2013, Tri-Global 2015, and 27 SOW 2012). Construction activities may overlap with the Proposed Action; however, the majority of the workforce and construction materials for these projects would not overlap. No additive impacts are anticipated from the development of wind energy projects when combined with the Proposed Action.

#### **4.1.2 Cumulative Impacts on Resources Areas under the Proposed Action**

Actions identified above in the area or temporal space of the Proposed Action would result in less than significant additive or cumulative impacts.

#### **4.1.3 Cumulative Impacts on Resource Areas under the No Action Alternative**

The No Action Alternative would result in a continuation of the existing conditions.

### **4.2 Unavoidable Adverse Impacts**

Unavoidable adverse impacts would result from implementation of the Proposed Action and are not anticipated to be significant.

**Geological Resources.** Activities such as grading, excavating, and trenching would result in some soil disturbance. Implementation of BMPs and standard erosion-control measures and compliance with the requirements of the NPDES Construction General Permit would limit the environmental consequences resulting from ground-disturbing activities.

**Infrastructure.** Solid waste generation would be an unavoidable but minor, adverse impact which could be partially mitigated by incorporating recycling practices, energy conservation efforts, sustainable principles, and Energy Policy Act of 2005 features.

**Hazardous Materials and Wastes.** The use of hazardous materials, generation of hazardous wastes, and potential for releases of these materials are unavoidable. The quantities of hazardous materials and wastes associated with operation of the Proposed Action would be minimal.

**Energy Resources.** The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy resources would be committed to the construction and operation of the Proposed Action, and committed amounts would not be considered significant.

#### **4.3 Compatibility of Proposed Action with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls**

Construction and operation of the reconfiguration for Melrose AFR would be consistent with existing and foreseeable future land uses.

#### **4.4 Relationship between Short-Term Uses of Man's Environment and Maintenance and Enhancement of Long-Term Productivity**

The potential short-term, adverse impacts of the Proposed Action include noise generation, air emissions, solid waste generation, soil erosion, stormwater runoff, and an increase in demand for water for dust suppression.

#### **4.5 Irreversible and Irretrievable Commitment of Resources**

Material resources irretrievably used would include steel, concrete, and other construction materials. Such materials are not presently in short supply and would not be expected to limit other unrelated construction activities. The irretrievable use of material resources would not be considered significant.

Energy resources including natural gas, petroleum-based products (e.g., gasoline, diesel, and lubricants), and electricity would be irretrievably lost. Gasoline, diesel, and lubricants would be used for the operation of construction vehicles. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

The use of human resources for construction is an irretrievable loss in that it would preclude personnel from engaging in other work. However, the use of temporary construction workers for the Proposed Action would represent employment opportunities and is considered beneficial but not significant.



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## 6. References

- 27 SOW 2012      27 SOW Public Affairs. 2012. Cannon Air Force Base & Eastern New Mexico: Partners in One Community. September 2012.
- 27 SOW 2011      27 SOW. 2011. Melrose Air Force Range, Environmental Assessment for the Comprehensive Range Plan. July 2011.
- ACC 2003          Air Combat Command (ACC). 2003. Environmental Assessment for the Use of White Phosphorus Rockets at Melrose Air Force Range, New Mexico. August 2003.
- ANSI 2013          American National Standards Institute. 2013. *Quantities and Procedures* Quantities and Procedures for Description and Measurement of Environmental Sound Part 3: Short-term measurements with an observer present.
- Bailey 1995        Bailey, R.G. 1995. Descriptions of Ecoregions of the United States: 2nd Edition. USDA-Forest Service Miscellaneous Publication 1391, Washington DC. 108 pp.
- BISON-M 2015     Biota Information System of New Mexico [BISON-M]). 2015. New Mexico Department of Game and Fish (NMDGF), Conservation Division.
- BLM 2013          Bureau of Land Management (BLM). 2013. Roswell Resource Management Plan Evaluation Report. December 2013.
- BLM 2008          BLM. 2008. Special Status Species Record of Decision and Approved Resource Management Plan Amendment. April 2008.
- BLM 1997          BLM. 1997. Roswell Resource Management Plan. Roswell Field Office.
- BLS 2015          Bureau of Labor Statistics (BLS). 2015. "Local Area Unemployment Statistics." Available online <<http://data.bls.gov/cgi-bin/dsrv?la>>. Accessed 27 May 2015.
- Cannon AFB 2014      Cannon Air Force Base (Cannon AFB). 2014. Final Comprehensive Range Plan, Melrose Air Force Range, New Mexico. October 2014.
- Cannon AFB 2012      Cannon AFB. 2012. Area Development Plan and Infrastructure Capacity Analysis Melrose Air Force Range, New Mexico. November 2012.
- Cannon AFB 2010      Cannon AFB. 2010. Integrated Natural Resources Management Plan (INRMP) 2009–2014, Cannon Air Force Base, Clovis, New Mexico. March 2010.
- Cannon AFB 2009      Cannon AFB. 2009. Final Comprehensive Range Plan, Melrose Air Force Range, New Mexico. February 2009.

- Curry County NM 2011 Curry County, New Mexico (NM) with support from the Office of Economic Adjustment, Department of Defense. 2011. Joint Land Use Study, Cannon Air Force Base and Melrose Air Force Range. January 2011.
- De Cunzo et al. 2015 De Cunzo, Antonio, Timothy Graves, and Peter C. Condon. 2015. *Cultural Resource Survey and NRHP Eligibility Assessment of 11,000 Acres of Newly Acquired New Mexico State Trust Lands, Melrose Air Force Range in Roosevelt County, New Mexico*. Versar Inc. El Paso, Texas.
- Harris 1998 Cyril M. Harris. 1998. Handbook of Acoustical Measurement and Noise Control. Acoustical Society of America. Sewickley, PA.
- IUCN 2015 Cuarón, A.D., Reid, F. & Helgen, K. 2008. *Spilogale gracilis*. The IUCN Red List of Threatened Species. Version 2015.1. Available online: <[www.iucnredlist.org](http://www.iucnredlist.org)>. Accessed 11 June 2015.
- Langman et al. 2004 Langman, J.B., F.E. Gebhardt, and S.E. Falk. 2004. *Ground-Water Hydrology and Water Quality of the Southern High Plains Aquifer, Melrose Air Force Range, Cannon Air Force Base, Curry and Roosevelt Counties, New Mexico, 2002-03*. United States Geological Survey Scientific Investigations Report 2004-5158, 42 p.
- Melrose AFR 2013 Melrose Air Force Range (AFR). 2013. Draft Phase 1 Qualitative Operational Range Assessment Report Melrose Air Force Range Roosevelt and Curry Counties, New Mexico. November 2013.
- NMBGM 2003 New Mexico Bureau of Mines and Geology (NMBGM). 2003. Geologic Map of New Mexico.
- NMCRIS undated New Mexico Cultural Resource Information System (NMCRIS). Available online: <<http://nmnistoricpreservation.org/arms/faqs.html>> and <<https://nmcris.dca.state.nm.us>>. Accessed 1 June 2015.
- NMED 2015 New Mexico Environment Department (NMED). 2015. Nonattainment Areas in New Mexico. Available online: <[https://www.env.nm.gov/aqb/modeling/na\\_map.html](https://www.env.nm.gov/aqb/modeling/na_map.html)>. Accessed 8 June 2015.
- NMRPTC 2015 New Mexico Rare Plant Technical Council (NMRPTC). 1999. New Mexico Rare Plants. Albuquerque, NM: New Mexico Rare Plants Home Page. Available online: <<http://nmrareplants.unm.edu>> (Latest update: 20 April 2015). Accessed 11 June 2015.

- Parmenter et al. 1996 Parmenter, R.R., E. Muldavin, P. Mehlhop, J.W. Brunt, G. MacKeigan, B. Pickering, E.R. Milford, S. K. Berckman, and S.E. Radjy 1997. An ecosystem survey of Melrose Air Force Range, Cannon AFB, New Mexico: development of a Geographical Information System (GIS). Department of Biology and New Mexico Natural Heritage Program University of New Mexico, Albuquerque, New Mexico. January 31.
- Parmenter et al. 1994 Parmenter, R.R., E. Muldavin, T.L. Yates, J.N. Stuart, G.H. Farley, and T. Maddux 1994. A Biological Survey of Melrose Air Force Range, Melrose, New Mexico. Department of Biology and New Mexico Natural Heritage Program, Albuquerque, New Mexico.
- Reclamation 2011 Bureau of Reclamation (Reclamation). 2011. Eastern New Mexico Rural Water System Environmental Assessment: Quay, Curry, and Roosevelt Counties, New Mexico Upper Colorado Region. January 2011.
- Roosevelt County 2013 Roosevelt County, New Mexico (Roosevelt County). 2013. Board of County Commissioners Ordinance No. 2014-01. 5 November 2014.
- SAE 2008 SAE International. 2008. SAE J1287 - Measurement of Exhaust Sound Levels of Stationary Motorcycles.
- State of New Mexico 2002 State of New Mexico. 2002. Title 20, Environmental Protection; Chapter 2, Air Quality (Statewide); Part 3, Ambient Air Quality Standards. Last updated on 31 October 2002. Available online: <<http://164.64.110.239/nmac/parts/title20/20.002.0003.htm>>. Accessed 22 May 2015.
- Tri-Global 2015 Tri-Global. 2015. "TexMex Wind Energy Project, LLC". Available online: <<https://www.triglobalenergy.com/ourprojects/texmexwindenergyprojectllc>>. Accessed 17 June 2015.
- USACE 1987 U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetlands Delineation Manual. January 1987.
- USAF 2013 U.S. Air Force (USAF). 2013. Biological Inventory Surveys Melrose Land Gift, New Mexico. December 2013.
- USAF 2011 USAF. 2011. Melrose Air Force Range Environmental Assessment for the Comprehensive Range Plan.
- USAF 2009 USAF. 2009. Cannon Air Force Base Integrated Cultural Resources Management Plan (ICRMP), Volume I and II. September 2009.
- USAF 2007a USAF. 2007. AFSOC Assets Beddown at Cannon Air Force Base, New Mexico Environmental Impact Statement. July 2007.
- USAF 2007b U.S. Air Force. 2007. SELCalc2 Aircraft Noise Model, Version 1.0.3.



- USAF 2002 U.S. Air Force. 2002. Air Force Instruction 32-7063: Air Installation Compatible Use Zone (AICUZ) Program
- USAF 1997 USAF. 1997. Final Integrated Natural Resources Management Plan (INRMP) at Cannon Air Force Base, New Mexico, and June 1999 FONSI. 31 March.
- US Army 2010 U.S. Army. 2010. Army Programmatic Environmental Assessment of the Mine Resistant Ambush Protected (MRAP) Vehicle Program. Available online:  
<http://aec.army.mil/portals/3/nepa/Army%20MRAP%20PEA%20DEC%202010.pdf>.
- US Army 2008 U.S. Army. 2008. Army Programmatic Environmental Assessment of the Use of the M1117 Armored Security Vehicle at Army Military Installations in the United States.
- USCB 2013 U.S. Census Bureau (USCB). 2013. "2011-2013 American Community Survey." Available online:  
<<http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed 27 May 2015.
- USCB 2010 USCB. 2010. "2008-2010 American Community Survey." Available online  
<<http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed 27 May 2015.
- USCB 2000 USCB. 2000. "Summary File 1 (SF 1) 100". Available online  
<<http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>>. Accessed 27 May 2015.
- USDA 2015 U.S. Department of Agriculture (USDA). 2015. Web Soil Survey website. Data for Roosevelt County, New Mexico. Available online:  
<<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>> Accessed 4 June 2015.
- USDA 2006 USDA. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. Natural Resources Conservation Service. Land Resource Regions Book AH-296.
- USEPA 2015 U.S. Environmental Protection Agency. 2015. New Mexico Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Last updated 30 January 2015. Available online:  
<[http://www.epa.gov/airquality/greenbook/anayo\\_nm.html](http://www.epa.gov/airquality/greenbook/anayo_nm.html)>. Accessed on 22 May 2015.
- USEPA 2011 USEPA. 2011. National Ambient Air Quality Standards (NAAQS). Last updated October 2011. Available online:  
<<http://www.epa.gov/air/criteria.html>>. Accessed on 22 May 2015.


- USEPA 1971      U.S. Environmental Protection Agency. 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. Washington, DC: s.n., Publication NTID300.1.
- USFWS 2015      U.S Fish and Wildlife Service (USFWS). 2015. Information for Planning and Conservation (IPaC). Available online: < <https://ecos.fws.gov/ipac/>>. Accessed 11 June 2015.

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# A

Stakeholder and  
Government Distribution  
List







# Appendix A: Stakeholder and Government Distribution List

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## Federal Elected Officials

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New Mexico Congressional Representative  
New Mexico Senators

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## Federal Agency Contacts

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Bureau of Indian Affairs; Southwest  
Regional Office  
  
Federal Aviation Administration -  
New Mexico Airports Development Office  
  
U.S. Fish and Wildlife Service (USFWS) -  
Southwest Region

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## State Elected Officials

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Governor of New Mexico  
  
New Mexico State Senator District 27  
  
New Mexico State House of  
Representatives District 64

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## State Agency Contacts

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New Mexico Department of Environment  
  
New Mexico Department of Game and Fish  
  
New Mexico Indian Affairs Department  
  
New Mexico Office Military Base Planning  
and Support  
  
New Mexico State Archaeologist  
  
New Mexico State Historic Preservation  
Division  
  
New Mexico State Land Office

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## Local Agency Contacts

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Curry County Board of Commissioners  
  
De Baca County Board of Commissioners  
  
Roosevelt County Board of Commissioners  
  
City Manager, City of Clovis  
  
Mayor, City of Clovis  
  
Mayor, City of Portales  
  
Mayor, Fort Sumner Village  
  
Mayor, Village of Melrose  
  
Mayor of Tillamook  
  
Tillamook County Board of Commissioners  
  
Tillamook County Parks

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## Tribal Contacts

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### ***Oregon***

Apache Tribe of Oklahoma  
  
Comanche Nation of Oklahoma  
  
Jicarilla Apache Nation  
  
Kiowa Tribe of Oklahoma  
  
Mescalero Apache Tribe

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## Other Interested Parties

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Private Citizens

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# B

Existing Munitions  
Expenditures



## Appendix B: Existing Munitions Expenditures

The existing munitions expenditures provided in this table would not change under the Proposed Action. All proposed munitions expenditures changes are provided in **Table 2-6**.

AIR TO GROUND	
Type	Amount
<b>BDU33 INERT (BOMB DUMMY UNIT)</b>	2,000
<b>BDU38 INERT</b>	50
<b>BDU48 INERT</b>	50
<b>BDU50HD INERT</b>	50
<b>BDU56 INERT</b>	50
<b>BDU85 INERT</b>	50
<b>GBU10 INERT (GUIDED BOMB UNIT)</b>	50
<b>GBU12 INERT</b>	50
<b>GBU31 INERT</b>	50
<b>GBU38 INERT</b>	25
<b>GBU40 INERT</b>	50
<b>GBU44 INERT</b>	50
<b>GBU53 INERT</b>	50
<b>MK81 INERT</b>	50
<b>MK82 INERT</b>	50
<b>MK83 INERT</b>	50
<b>MK84 INERT</b>	50
<b>MK106 INERT</b>	50
<b>20 MILLIMETER (MM)</b>	3,500
<b>25 MM-TP (TARGET PRACTICE)</b>	20,000
<b>25 MM-HE (HIGH EXPLOSIVE)</b>	10,000
<b>40 MM-TP</b>	40,000
<b>105 MM-TP</b>	20,000
<b>105 MM-HE</b>	10,000
<b>105 MM-HE/HF (HIGH FRAGMENTATION)</b>	3,000
<b>105 MM-WP (WHITE PHOSPHORUS)</b>	1,000
<b>2.75 ROCKET</b>	
M-151	100
OTHER	25
<b>70 MM ROCKET</b>	
WP	1,000
SPOT	1,000
HE	1,000
TP	1,000



AIR TO GROUND	
Type	Amount
FLECHETTE	1,000
.50 CAL BALL	50,000
.50 CAL APT/API (ARMOR PIERCING TRACER)	50,000
.50 CAL BALL	20,000
.50 CAL APT/API	20,000
.50 CAL HE	10,000
<b>SOPGM (Stand Off Precision Guided Munition)</b>	
AGM114P (AIR TO GROUND MISSILE)	50
AGM176	200
GBU39 INERT	25

GROUND USER	
Type	Amount
<b>12 GAUGE</b>	
#00 BUCK	5,000
#9	33,000
NONLETHAL	1,000
<b>5.56</b>	
BALL	6,000,000
BLANK	1,000,000
PLASTIC	410,000
TRACER	40,000
<b>7.62</b>	
BLANK	30,000
LINK	30,000
BALL LINK	2,500,000
<b>9 MM</b>	
TRACER	1,000
BALL	1,960,000
<b>.45 CALIBER</b>	
BALL	20,000
<b>.50 CALIBER</b>	
BALL LINK	850,000
LINK TRACER	500,000
BLANK	10,000
SINGLE ROUND	1,000
<b>40 MM</b>	
GREEN STAR	100
RED STAR	100

GROUND USER	
Type	Amount
TP	26,250
WHITE STAR	100
HE	80,000
SMOKE	500
MULTI PROJECT XM576	50
HEDP M433 (HIGH EXPLOSIVE DUAL PURPOSE)	9,000
<b>60 MM</b>	
HE	7,000
ILLUMINATION	100
<b>81 MM</b>	
HE	5,000
ILLUMINATION	100
84 MM ROCKET	410
83 MM HIGH EXPLOSIVE ANTI-ARMOR (HEAA) MK6	10
FUZE HAND PRACTICE	50
<b>HAND GRENADE</b>	
GREEN FRAGMENTATION	5,000
SMOKE	3,000
MINE ANTIPERSONNEL (APERS)	2,200
CHARGE DIVERSIONARY	2,000
MISSILE SURFACE (JAVELIN)	10
SIGNAL ILLUMINATION (GREEN SMOKE) GS PARACHUTE	50
SIGNAL ILLUMINATION (RED SMOKE) RS CLUSTER	25
SIGNAL ILLUMINATION (WHITE SMOKE) WS CLUSTER	50
SIGNAL ILLUMINATION RS PARA	25
SIGNAL ILLUMINATION WS PARA	50
SIGNAL ILLUMINATION GS CLUSTER	50
FUZE WARNING RAILROAD (RR) RED	50
SIMULATED PROJECT GROUND BURST	1,000
SIMULATED BOOBY TRAP FLASH	500
SIMULATED BOOBY TRAP ILLUMINATION	500
SIMULATED BOOBY TRAP WHISTLING	500
SIMULATED HAND GRENADE	200
C4 BLOCK 1.25 POUNDS	100
CAP BLAST	25
CAP BLAST NON-ELECTRIC	100
DETONATOR CORD	1,500
TIME FUZE	1,500
IGNITER FUZE	100

GROUND USER	
Type	Amount
CAP BLAST N-ELECTRIC 30 FT	50
CAP BLAST N-ELECTRIC 500 FT	50
CAP BLAST N-ELECTRIC 1,000 FT	50
IGNITER TIME FUZE	100
TIME DELAY FIRING DEVICE	50
5.45 × 39 MM BALL	26,000
7.62 × 39 MM BALL	15,000
7.62 × 54 MM BALL	5,000
ROCKET PROPELLED GRENADE (RPG)-7	50
SIGNAL KIT	25
COMPOSITION 4 1.25 DEMO CHARGE	100
COMPOSITION B DEMO CHARGE	10
35 MM/M190 LAUNCHER ROCKET	1,500
INNERTUBE ASSEMBLY LAUNCHER M190	1,500
66 MM LAUNCHER ROCKET	30
66 MM M72A3 HE ROCKET	10
TRAINING FLARES	1,000
66 MM LIGHT ANTI-TANK WEAPON (LAW) ROCKET	100
120 MM MORTAR TP	500
120 MM MORTAR ILLUMINATION	500
MK124-0	25
MK125A1	25
MK49A1	25
MK25 MARKER	25
1 POUND TNT DEMO CHARGE	100
40 MM TP M918 LINKED	16,000
HAND SMOKE WHITE HIGH CAPACITY (HC)	32
HAND INCENDIARY	16
35 MM PRACTICE F/M190 LAUNCHER ROCKET	1,100
PRACTICE LAUNCHER	25
SMOKE GRENADES	60
MINES	2,200
GRENADES	7,600
FLARES	2,100
84 MM ANTI-TANK-4	60